Intertwining paths towards a common goal: Three emergency units side by side.

Maria Borén

Master of Philosophy in Psychology

Department of Psychology
UNIVERSITY OF OSLO

May 2012

Abstract

Emergency response efforts usually involve several teams from different agencies who are working to save lives or property. It is becoming more usual that the commander responsibilities are being performed in a context of multi-agency and multi-jurisdictional response. This paper explores the interdisciplinary collaboration between emergency response leaders. This is done through examining to which extent a practical check-list and a theoretical model of interdisciplinary collaboration were able to account for interview statements from operative leaders in the three emergency units in Norway regarding collaboration Semi-structured interviews were performed with 17 operational leaders with experience from working in Incident Command Post (ICP). Based on a mixed-model approach, the interviews were transformed into quantitative data and analyzed in SPSS. The results revealed that neither the practical frameworks nor the theoretical model were able to account for all the statement. When the two frameworks were combined they accounted for 1516 of the 1649 statements that were identified in this study. The 133 remaining statements were analyzed with the help of a content analysis, which identified 6 new categories. This implies that a framework for collaboration in the emergency response domain cannot be based entirely on the studied models.

Acknowledgements

Through an collaboration with SINTEF, I got the opportunity to write this thesis under the European project Bridge. It has been a great way to gain an understanding of the field and to get in contact with domain experts. It has been a wonderful opportunity and an interesting and instructive process, and several people have helped me along the way. I will therefore first of all thank my supervisors Cato Bjørkli at the University of Oslo for put me in touch with SINTEF, for his constructive feedback and support throughout the project. I've learned a lot through this process. I also want to give a big thanks to Gunnar Coll and Svein Dagfinn Staff for constructive feedback on this paper. And thanks to Jon Martin Sundet for the methodical support. Thanks to Ida Maria Haustveit and Karen Ranestad that helped plan and carry out the project with me. Thank you for many useful conversations, good support and an incredible unity during the entire period.

Furthermore, I thank Pål Lystad and Bjørn Danielsen for their help with recruiting informants to the study, and of course everyone who participated. Without you, this study would not have been possible to implement. I hope that my findings can contribute to something useful for you in the future. Thanks to everyone in the class for good support. Finally, I thank my closest friends and family for always being there for me. Their support is irreplaceable and I appreciate you a lot.

Table of contents

Abstract 2

Acknowledgements 3

The Norwegian rescue service. 7

Standard Operational Procedure 8

FORSTÅTT 8

Collaboration 13

Communication and information flow. 13

Situation awareness. 14

Interdisciplinary collaboration 14

A Model for Interdisciplinary Collaboration 15

Present Study 19

Methods 21

Partners 21

Understanding the Domain 21

Informants 22

Mixed Model Design 23

Process 24

Preparation 24

The interview 24

Transcription 25

Unitizing. 25

Inter-judge reliability of unitizing. 26

Coding. 26

Statistical analysis. The statistical analysis included d 27

Thematic analysis 27

Ethical considerations. 27

Results 28

Descriptive Statistics 28

Figure 1. 31
Hypothesis Testing 32
Post Hoc Analysis 33
Discussion 34
Summary of Results 34
The Post Hoc Analysis 36
FORSTÅTT Check-List 37
The Interdisciplinary Collaboration Model 39
Combining the two frameworks 39
The Residual Categories 40
General Discussion 42
Limitations 44
Future Studies 46
Conclusion 47
References 48
APPENDIX A: INFORMATION LETTER 55
APPENDIX B: CONSENT FORM 57
APPENDIX C: INTERVIEW GUIDE 59
APPENDIX D: TRANSCRIBING PROCEDURES 61
APPENDIX E: UNITIZING PROCEDURES 62
APPENDIX F: CODING PROCEDURES 66
FORSTÅTT 66
Samhandlings modell 69

Terrorist attacks and natural disasters have brought considerable attention to the role government agencies must play in maintaining national security. In recent years, several countries in the world have been severely affected by natural disasters and extreme weather situations. From 1970 to 2010, There has been a gradual increase in the number of natural disasters in the world. In 2005, Hurricane Katrina hit the coast of Louisiana with a wind speed of over 260 km / hour and about 1 300 people died (Direktoratet for samfunnssikkerhet og beredskap, 2011). In 2004 when an earthquake and tsunami in the Indian Ocean affected more than ten countries and over 280,000 were killed (Ekerberg, Skogstad, & Myhrer, 2008). There have also been an increasing number of natural events in Norway, such as Gudrun in 2005 and Dagmar at the end of 2011. Terror attacks like September 11 in New York, the London bombings of 2005 and the terrorist attacks in Madrid, March 2004 contributed to an increased focus on rescue and emergency preparedness in relation to extreme events in Norway (Direktoratet for samfunnssikkerhet og beredskap, 2004). With the terror attacks in Norway this became even more important. Even though this is relevant for the topic, this will not be discussed in detailed in this thesis.

It is important to understand how to respond as Norway faces a growing number of major incidents in the form of terrorism, natural disasters and technical accidents. Large scale incidents are according to Flin (1996) different from routine incidents in many ways. She describes large scale incidents as incidents involving limited control, sometimes extending over a large area with long time duration and larger risks. These situations often necessitate multiple agencies working together and sharing information with other agencies. There has been few large scale incidents in Norway up until now (Direktoratet for samfunnssikkerhet og beredskap, 2012), which has given the incident personnel limited experience with large-scale operations. There is a need in Norway, as the rest of the world, to prepare for the increasing number of large scale incidents. But in order to recognize how these emergency units handle emergency situations in Norway it is a necessity to understand how they collaborate and how they are organized.

This paper will therefore describe how the emergency response agencies in Norway collaborate with each other and how they are organized. This will be presented through theory and two frameworks; firstly the organization of the emergency services and a practical framework based on an incident management checklist is presented. Secondly theory about

collaboration between several agencies is presented and a theoretical model that explains the necessary elements for an effective interdisciplinary collaboration is presented.

The Norwegian rescue service. The rescue service in Norway is not made up by one organization, but is a function carried out through collaboration between several agencies, and is a combination of government agencies, NGOs and private companies that have the appropriate resources (Høringsutgave av *Håndbok for redningstjenesten*, 2008). Collaboration between emergency response units has so far received relatively little scientific attention, despite its obvious significance (Rui Chen, Sharman, Chakravarti, Rao, & Upadhyaya, 2008). According to McGuire (2006) multi-organizational collaboration is often arranged as a reaction to problems that are not easily solved by single organizations. In this paper collaboration is defined as: "When a group of autonomous stakeholders of a problem domain engage in an interactive process, using shared rules, norms, and structures, to act or decide on issues related to that domain" (Wood & Gray, 1991, p. 146). Collaboration increases the likelihood of good decisions (Kerr, 2004), reduces the risk of human error (Reason, 2000) and provides multiple approaches to the given situation (Aboelela et al., 2007). Rescue service is a priority for the emergency units although some of them daily perform other tasks ("St.meld. nr. 17 (2001-2002) Samfunnssikkerhet," 2012). Even though the emergency units collaborate in the incident response, the different emergency units have their own areas of responsibilities.

The roles and responsibilities are organized by the principles of similarity, responsibility and equality. Ambulance personnel have the main responsibility for the patients and the fire department focuses on technical rescue tasks. The police have the main responsibility for the incident management, coordination management and security. The agencies have different education, training, equipment and procedures. The agencies manuals, curricula, rules of thumb and mindset are also different. Yet they all have a common goal: to save lives (Vigerust, Andersen, & Vollebæk, 2009). This common goal includes different things for the different departments. For the police it might be securing a scene or stopping violent acts, and for the health department might include preform first aid or transporting patients to a hospital. The task of saving lives is too complex for one department to handle alone (*Håndbok for redningstjenesten*, 2008). It is therefore often necessary for several agencies to collaborate, each offering some expert contribution to the rescue operation (Wimpfheimer, Bloom, &

Kramer, 1991). This creates a need for someone to take the lead and coordinate the units at the incident site.

The incident management usually consists of an incident commander from the police, operational commander fire and an operational leader health. The incident commander is responsible for organizing, managing and coordinating the work at the incident area. In Norway the incident commander responsibility is given to the police (with some exceptions (Politidirektoratet, 2011)). Their responsibility is primarily facilitation of the professional efforts and coordination of resources and support. The incident manager should, in other words, not command the professional efforts of the fire department and the health department. To ensure the collaboration between the three emergency units, the incident commander together with the operational commanders from the health and fire department are gathered in an Incident Command Post (ICP) (Politidirektoratet, 2011).

In light of the increase in large and complex events, there is a need for increased interdisciplinary collaboration. In order to understanding the collaboration between the Norwegian emergency a practical cheek list developed based on standard operational procedures is presented.

Standard Operational Procedure

This section will explain the concept of standard operational procedures, and then present a proposal for a common operational procedure made by the Norwegian Air Ambulance. The operational procedures presented by the Norwegian Air Ambulance includes six phases and a list of eight categories of actions that shod be performed at the incident area.

Standard operational procedures guide the operational effort when the operational leaders work together in ICP. These cheek lists are essentially a list of tasks to be solved (Chen, 2008). The procedures are tools that might help them to start an effective and focused initial effort. A general tendency within crisis management is to recommend common strategies, plans and operational procedures (McConnell & Drennan, 2006).

FORSTÅTT

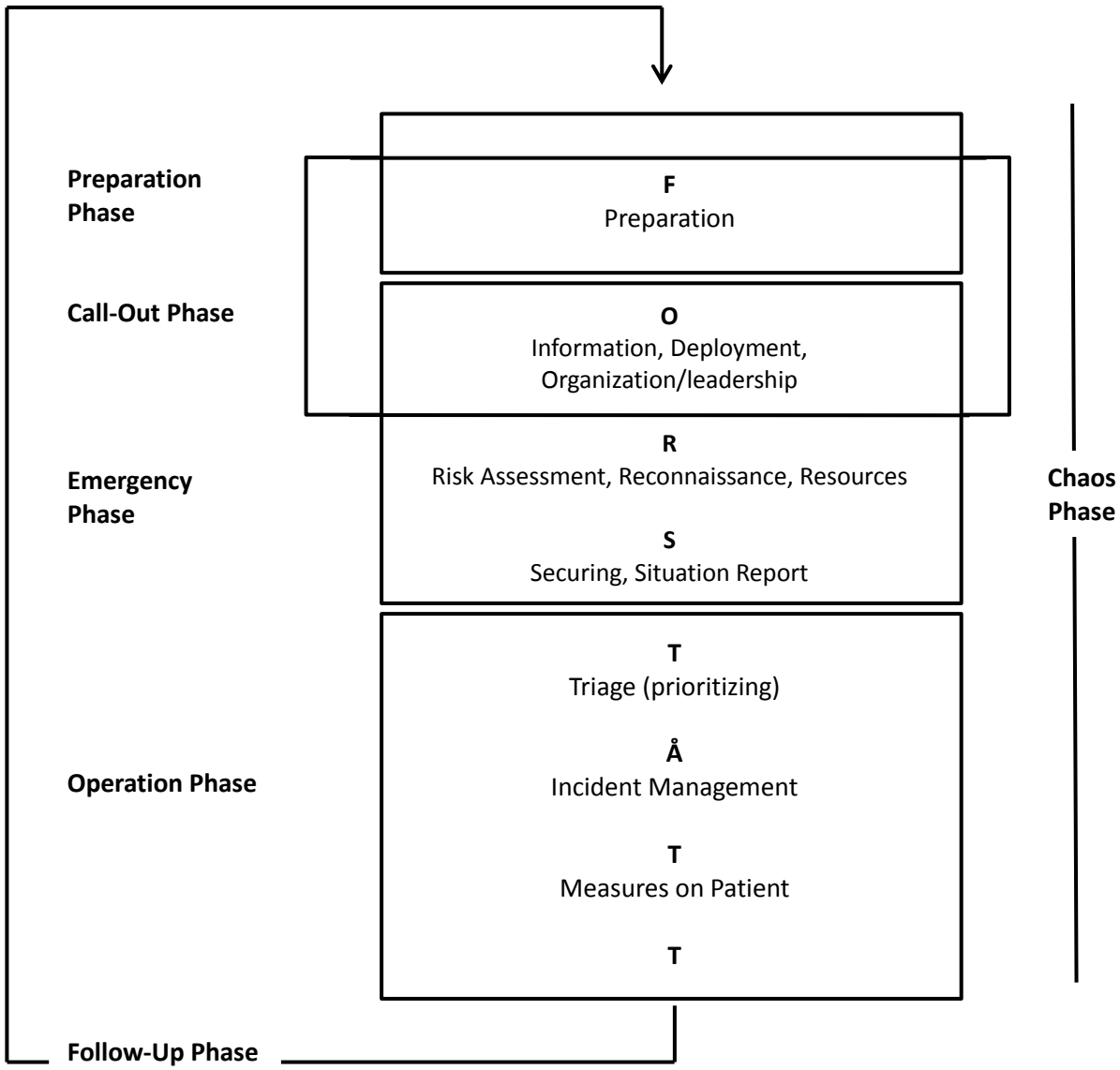
The three emergency units (fire, health and police) are the agencies that most frequently work together in Norway. The various agencies all have their own standard operational procedures, but they share a common main goal; to saving life. Although different

agencies have fairly similar views on what must be done in the area of deployment, they use different language and terms which can make communication and collaboration difficult.

The Norwegian Air Ambulance has developed a set of common operating procedures for the three emergency units in Norway. This common operational procedure is called "FORSTÅTT" and explains the common tasks at the site of deployment (Vigerust et al., 2009). These procedures were developed as part of the interdisciplinary emergency medicine collaboration courses (TAS) offered by the Norwegian Air Ambulance and were based on the manuals and procedures that already exist in the different agencies. FORSTÅTT looks at the operation period in chronological order with regard to various common processes to be initiated at different stages within the operation. The FORSTÅTT check-list is result-driven, and the goal of these procedures is to create a shared operational language and to increase inter-agency collaboration (Vigerust et al., 2009).

Model 1

The FORSTÅTT check-list



The FORSTÅTT check-list are sequential, and listed as necessary actions within phases. FORSTÅTT consist of eight elements and six phases that can help the emergency personnel preform a common rescue operation. FORSTÅTT is an acronym for the Norwegian words for the eight elements in the procedure; Preparation (Forberedelse), Information, Deployment, Organization/leadership (Opplysninger, oppmarsj og organisering/ledelse), Risk Assessment, Reconnaissance, Resources (Risikovurdering, rekognosering og ressurser), Securing, Situation Report (Sikring og situasjonsforståelse), Triage (prioritizing) (Triage), Management of the site (Åstedshåndtering), Measures on Patient (Tiltak på pasient), Transportation to Hospital (Transport til sykehus).

In Vigerust et al. (2009) the elements of FORSTÅTT is described as steps in the phases. The phases are presented here as they are important as a context for the elements in FORSTÅTT, but they will not be used further in this paper. Next the elements of the FORSTÅTT cheek-list are described one by one.

The six phases of the procedures are; the first phase is the preparation phase, this phase includes the F (Preparation) and includes everything they do to be prepared before the alarm goes off. Secondly there is the call-out phase; this phase includes both the F (Preparation) and the O (Information, Deployment, Organization/leadership) elements in the FORSTÅTT check-list. The third phase is the emergency phase which is where they try to get control of the situation, and includes the O (Information, Deployment, Organization/leadership), R (Risk Assessment, Reconnaissance, Resources) and S (Securing, Situation Report). The operation phase is when things are starting to fall in to place and includes the T (triage), Å (incident management), T (measures on patient) and the T (transportation to hospital). The follow-up phase is when the incident is over and the units evaluate their performance and the situation returns to normal. This phase is not elaborated in the FORSTÅTT check-list. The final and sixed phase is the chaos phase. The other phases follow a chronological order. Chaos phase violates chronology and can occur at any time during a reaction. This phase can vary from person to person. Anyone can end up in this phase. For those with little experience and training it can occur on a minor traffic accident, while for others this may happen by major disasters. Characteristics are stress, tunnel vision and lack of overview of the situation.

F = preparation (Forbredelse) Being prepared for all types of events. This includes existing professional knowledge and experience, training and education, as well as establishing standard operational procedures. Securing equipment and tools, as well as bringing the necessary equipment and resources to the area of deployment. Preparing for all kinds of weather and environment and thinking through the security. Establishing contact with other emergency units.

O = information, deployment and organization / management (opplysning, oppmarsj og organisering/ledelse). Gather and provide information, request sufficient resources and confirm that the resources are on the way. Follow deployment plan; placement of vehicles appropriately to ensure escape route. Create incident command post (ICP) and communication with dispatch centers.

R = risk assessment, reconnaissance and resources (risikovurdering, rekognosering og ressurser). Assess the risk and safety, obtaining an overview and adjust the resources according to the situation. Do the reconnaissance together with the other leaders in CP. Notify Red Cross, NSB, the landowners, etc.

S = securing and situation report (sikring og situasjonsrapport). Ensuring the safety of personnel and plan escape routes. Giving and receiving situation report from the dispatch centers and making adjustments to the resources as needed. Be predictive and not reactive and event-driven. Provide and obtain good, accurate and time-critical information.

T = triage (prioritizing) (triage og prioritering). Prioritizing of patients so that everyone gets the right treatment at the right time. First priority is life, then property and the environment.

Å = the incident site management (Åstedshåndtering). Continue with the operative work at the scene, this includes good overview of the situation, clear roles and responsibilities, handling of media and Communication, Coordination and Control.

T = measures on patient (tiltak på pasient). Life-saving measures is the main priority for all agencies, after triage, provide physical and psychological first aid to all involved.

T = transportation to hospital (transport til sykehus). Starting the transport of critical patients to the hospital as early as possible. Give a report to the medical dispatch center about

the patients. Establish cooperation between patient assembly area and the evacuation control point.

The FORSTÅTT check-list with its eight categories organized into six phases describes the incident management process from the beginning and to the end. The follow-up phase is not further described with any of the FORSTÅTT elements and the chaos phase does not follow any sequential order and is unpredictable. All of these phases and elements might help the operational leaders in ICP to organize the incident site in a collaborative manner.

The FORSTÅTT check-list lists some common elements for all three emergency units. As mentioned earlier this cheek list is developed as a tool to create a shared language and hope to increase collaboration between the different units. It might be interesting to look closer at collaboration between two or more agencies and the factors that can influence the collaboration. The next section of this paper will therefore take a closer look at collaboration and influencing factors, before a model of interdisciplinary collaboration is introduced.

Collaboration

There is an international move towards assuming integrated emergency management (IEM). This integration of the three units in the incident management will to a greater extent result in command responsibilities being performed in a context dominated by multi-agency and multi-jurisdictional response (Paton, Johnston, & Houghton, 1998). As mentioned earlier this is also the case in Norway. Aspects that can be affected by the multi-agency collaboration might be information management, decision making, team work and incident management processes. Most of these elements are essentially determined by the quality of the communication between the emergency units and the ability to obtain shared situation awareness. This makes communication and situation awareness interesting topics within the collaboration literature that are worth a closer look.

Communication and information flow. Disasters represent occasions where the boundaries between the various emergency services are blurred (Kapucu, 2006) and can involve a complex network of interdependent agencies (Bigley & Roberts, 2001). It is important that information flows in a coordinated manner through a multi-organizational and multi-level network. This means, that for the organizations to function, they are dependent on not only their internal interactions, but also on the collaboration with other agencies (Bharosa, Lee, & Janssen, 2010). According to Pužar, Andersson, Plagemann, and Roudier (2005) there are two essential requirements for effective collaboration; the motivation to collaborate and

the capability to communicate and share information efficiently. A number of studies indicate that low information sharing and coordination throughout inter-agency disaster response shows a negative influence on collective decision-making and collaboration (Dawes, Cresswell, & Cahan, 2004; Helsloot, 2005; Junglas & Ives, 2007; Pan, Pan, & Devadoss, 2005). Well-organized and secure communication and information exchange between the emergency units are crucial to limit the damage, save lives and ensure personnel safety within large-scale incidents and disasters (Lereim et al., 2012). Collaboration is important to insure communication and information flow between the units. For an efficient information flow and communication between the operational leaders in ICP they need to create a shared picture of the situation (Harrald & Jefferson, 2007). Situational awareness in the context of emergency response is explained in the next section.

Situation awareness. For an effective disaster and emergency response during an event, it is important that the rescue workers have proficient communication skills and a high levels of situational awareness (Dilmaghani, Manoj, & Rao, 2007; Harrald & Jefferson, 2007). Situation awareness has been defined as "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future" (Endsley, 1995, p. 36). According to Waugh and Streib (2006) the poor communication and lack of situation awareness was among the main problems with the command when handling the disaster after Hurricane Katrina. Oomes (2004) argues that there also is a need for organizational awareness to obtain an efficient collaboration and communication at incidents that involves multiple emergency services. Organization awareness is an understanding of the multiple agencies that make up the organization and how they relate to each other. When individuals collaborate they rely on situation awareness in all stages of the information process to help them combine their unique knowledge and skills to reach their goals (Sonnenwald, 2004).

As collaboration and certain influencing factors have been introduced it is about time to clarify the terminology in this paper by first looking at the most frequently used terms for explaining collaboration between two or more different agencies or disciplines. Followed by an presentation of a model for interdisciplinary collaboration. This model is based on theory rather than practice and attempts to list all the necessary elements in collaboration between agencies.

Interdisciplinary collaboration. Interdisciplinary and multidisciplinary collaboration are terms that have been extensively compared and contrasted (Besselaar & Heimeriks, 2001;

Jessup, 2007; Lawrence & Despres, 2004). Terms that have been used to name or describe collaboration between more than one field are interdisciplinary, multidisciplinary, inter-professional, and team-focused collaboration (Besselaar & Heimeriks, 2001; Kenny, 2002; Salipante, 2002; Stout, 1997). All of these terms are defined in several ways. There also seems to be a lack of consensus about the difference between inter- and multidisciplinary collaboration (Lawrence & Despres, 2004). According to Besselaar and Heimeriks (2001) *Multidisciplinary* is when several disciplines are working side by side, but not integrated. Each discipline keeps its methodologies and assumptions without change or development from other disciplines within the multidisciplinary relationship. An *interdisciplinary* field is a field that crosses traditional boundaries between disciplines or schools of thought. An interdisciplinary approach creates its own theoretical, conceptual and methodological identity. As the emergency units are organized as three different departments with individual procedures, working methodology and concepts, they would seem to be multidisciplinary rather than interdisciplinary. However, when they work together in ICP they create mutual strategies, they share information and are dependent on each other, which appears more like interdisciplinary collaboration.

Interdisciplinary collaboration is therefore an unresolved area, but tries to explain the collaboration between agencies with different professional backgrounds. Based on that observation, this paper will draw mostly on interdisciplinary literature, and chooses to understand interdisciplinary collaboration as two or more disciplines working together toward a common goal. One way to understand collaboration between different disciplines is through Laura Bronstein`s model of interdisciplinary collaboration.

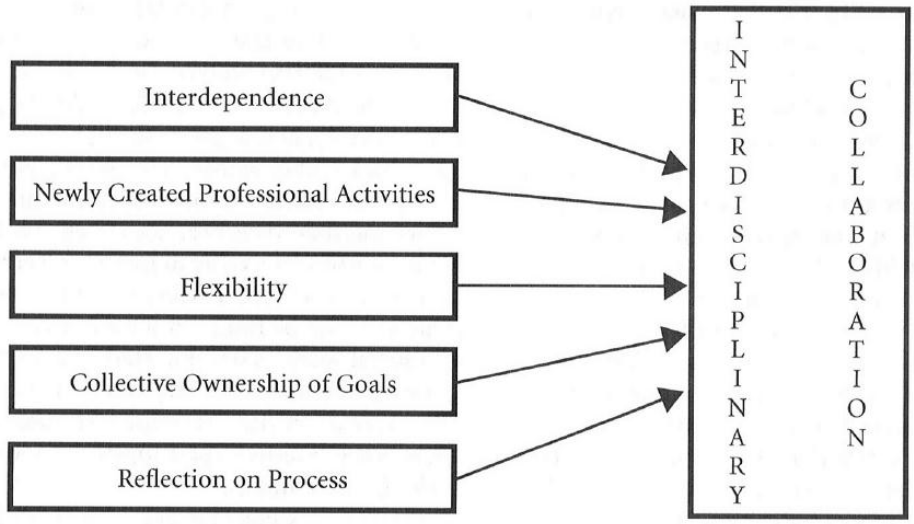
A Model for Interdisciplinary Collaboration

Bronstein´s (2003) model of interdisciplinary collaboration, "A Model for Interdisciplinary Collaboration" is based on the work of American social workers. But by drawing from several theoretical frameworks (through an integration of a multidisciplinary theory of collaboration, services integration, role theory, and ecological systems theory (Bronstein, 2003)), the intention of this model is to provide a generic model for social workers: "Although differences exist among disciplines, this model is meant to be a generic depiction of the components of optimum collaboration between social workers and other professionals" (Bronstein, 2003, p. 299). This model might therefore also explain the elements necessary for interdisciplinary collaboration within the emergency response field.

Responding to an extreme event requires collaboration by several organizations with different cultures and structures. The work situations of social workers are in many ways different from that of emergency response workers. However, the emergency response personnel also needs to collaborate across disciplines, and share a common goal of saving lives, this model might therefore be suitable to explain the collaboration between emergency units as well.

Model 2

Interdisciplinary collaboration model



(Bronstein, 2003)

Bronsteins model is one of few models that are designed for interdisciplinary collaboration (Bronstein, 2002). Her work points to five essential elements for successful collaboration, these are; interdependence, new created professional activities, flexibility, collective ownership of goals and reflection on the process. Each of these elements will be described in more detail:

Interdependence: occurs when different professions rely on interaction between disciplines and are dependent on the others to accomplish their own goals and tasks. They must have a clear, mutual understanding of roles and use them correctly. Interdependence usually consists of formal and informal gatherings, oral and written communication, and respect for all employees, professional opinions and suggestions.

Newly created professional activities: is when collaborative acts, programs, and structures can achieve more than if the professionals acted independently. These activities

maximize the expertise of each collaborator. One example is when the fire department assumes responsibility as the Operations Commander until the police arrives at the site.

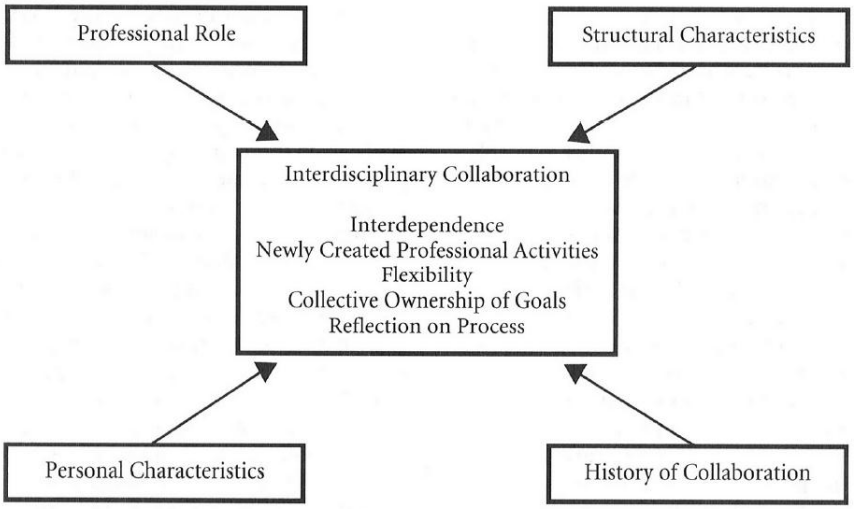
Flexibility: is the intentional occurrence of role-blurring. Typical characteristics of flexible behavior are to compromise when disagreements occur and the modification of roles as a creative solution to a situation. According to Mendonça, Jefferson and Harrald (2007) emergency personnel may take on new or expanded roles, adjust the organizational structures, and adapt existing technological tools to unexpected needs to meet response goals.

Collective ownership of goals: refers to common responsibility in the whole process of reaching goals, including design, definition, development, and achievement of goals. Each professional must take responsibility for their own part in success and failure and support constructive disagreement and discussion within the team. This also includes common goals, strategies, making decisions together, and having a well-defined and realistic goal. In complex and turbulent environments, organizations frequently develop formal or informal relationships in order to work together to pursue shared goals, address common concerns, and/or attain mutually beneficial ends (Kapucu, 2005).

Reflection on process: includes collaborators thinking and talking with each other about their working relationship and process, and including feedback to each other in their evaluation process to strengthen collaborative relationships and effectiveness. It is also important to evaluate after smaller incidents as well as larger scale incidents (Politidirektoratet, 2011). Bronstein (2003) also describes four influencing factors on interdisciplinary collaboration. These are factors that put the collaboration model in context and are individual, group and external factors like society and the organization. The influencing factors can be barriers to collaboration or motivating factors.

Model 3

Influencing factors on interdisciplinary collaboration



(Bronstein, 2003)

Professional role: A strong sense of professional role include a commitment to the agency settings, respect for professional colleagues and a perspective that is similar or complementary to the perspectives of colleagues. Factors that influence the professional role are status, hierarchy, roles, values and practice. Differences among professions are intensified by the value each professional places on autonomy and the ability to be self-directed.

Structural characteristics: This includes a manageable caseload, an agency culture that supports interdisciplinary collaboration, financial support, administrative support, professional autonomy, and time and space to collaborate.

Personal Characteristics: In this setting this includes how collaborators view each other outside the professional role the colleague holds. Influences on collaboration might be; trust, respect, understanding or similar perspectives and informal communication among colleagues.

History of collaboration: This is previous experience from interdisciplinary teams. If professionals have a history of working in interdisciplinary teams, their experience with this kind of work may color future collaboration. By including the influencing factors the collaboration process is put in a contest based on personal trades, experience and external factors like interpersonal and organizational factors. These factors can hinder or promote collaboration between the various agencies and individuals. This might be important as the three operational leaders in ICS are associated with different organizations, have different

professional backgrounds and in general have different preconditions (Bharosa et al., 2010). The combination of collaboration elements and influencing factors might present a holistic view of interdisciplinary collaboration.

The FORSTÅTT check-list and interdisciplinary collaboration model are two frameworks that explain the collaboration process in two different perspectives. As the FORSTÅTT check-list are practical and sequential and the interdisciplinary collaboration model with concrete elements of the collaboration and the influencing factors. Although research on collaborative public management and cross-sector collaboration is flourishing, the research within the field of emergency response is still under developed (Simo & Bies, 2007). Based on that an interdisciplinary model based a different domain and a domain specific framework was presented to gain both perspectives.

Present Study

This study seeks to investigate if a generic model or a domain-specific model is the more appropriate for describing interaction between police, fire and health managers at a major incident. The generic model "an interdisciplinary collaboration model" describes the essential elements of collaboration between two or more disciplines. The domain-specific procedure system "FORSTÅTT" focuses on the necessary steps to ensure an effective incident management by all three leaders in the incident command post (ICP). The interviews were structured using the SWOT framework, which aims to identify positive and negative aspects of the presents and the future. Semi-structured interviews were conducted to gather information about the collaboration between emergency response leaders from the police, fire-department and ambulance services. The interview questions were open ended, giving the informants the opportunity to speak freely about the subject. The interviews were coded into the categories of the two frameworks, and then analyzed through the number of statements that can be encoded in the model and the procedures (see methods for further description). The purpose of this study is to provide empirical support for how well the model or the procedures can be used to explain collaboration between emergency response units in Norway. The research question of this paper is:

How well can FORSTÅTT check-list and the interdisciplinary collaboration model account for the collaboration between emergency response leaders in the central eastern area of Norway?

The research question will be answered by testing four possible alternatives; the FORSTÅTT check-list, the interdisciplinary collaboration model, a combination of the two or a modified version of the combination of the model and the procedures including potential residual categories.

Standard operational procedures are widely used in emergency response (Flin, Slaven, & Stewart, 1996), and as mentioned earlier it is often recommended to make shared operational procedures (McConnell & Drennan, 2006). The standard operational procedures in the emergency response units in Norway are still separate, but the FORSTÅTT check-list that have been presented by the Norwegian Air Ambulance is an attempt to create a set of shared procedures. According to Vigerust et al. (2009) these procedures seeks to improve the collaboration and create a common language between the three emergency units. The following hypothesis will therefore test if that is the case:

> *Hypothesis 1: There will be no significant difference between the number of statements captured by the FORSTÅTT check-list and the total number of statements about collaboration.*

The interdisciplinary collaboration model presented by Laura Bronstein (2003) explains the necessary elements for en effective collaboration between personnel from different professions. She argues that her model is generic (Bronstein, 2002), and that even though differences among collaboration relationships exists, the elements that are important for collaboration are the same regardless of the field. If the interdisciplinary collaboration model is generic, the model should be able to explain all the statements concerning collaboration. The following hypothesis will test this claim:

> *Hypothesis 2: There will be no significant difference between the number of statements captured by the interdisciplinary collaboration model and the total number of statements about collaboration.*

The FORSTÅTT check-list system is a framework that provides the three units have a common language and understanding of the steps necessary to ensure a safe, efficient and holistic solution of the situation. The interdisciplinary collaboration model looks at the characteristics of a well working collaboration situation. Therefore the collaboration between the three units may best be describes by a combination of the operational procedures

investigated by FORSTÅTT and the interdisciplinary collaboration between the people working within the all three units, by combining the models.

Hypothesis 3: There will be no significant difference between the number of staments captured by the FORSTÅTT check-list and the Interdisciplinary collaboration model combined and the total number of statements about collaboration

Since the FORSTÅTT check-list and the Interdisciplinary collaboration model seeks to cover all statements about collaboration the residuals should only comprise of irrelevant information when investigating collaboration between the three emergency units.

Hypothesis 4: The residuals will only include statements that are irrelevant for collaboration

Methods

Partners

This paper is written as part of the European project *Bridge* as a result of a partnership between the Department of Psychology (UiO), Research Group for Work and Organizational psychology and SINTEF. The project aims to increase safety and security for the population in Europe through better technical and organizational solutions, especially emergency services coordination and management of large-scale emergency events such as terrorist attacks, natural disasters and industrial accidents. The Bridge project (http://www.sintef.no/home/Press-Room/Research-News/Better-prepared-for-major-disasters/) is an collaboration between universities, research groups, technological firms and domain experts. The project started in April 2011, and will continue until 2014.

Understanding the Domain

The domain has been approached by means of document analysis, participation in a workshop organized by SINTEF (Bridge) and observation to understand the domain. Through this process, the relevant topics became clear and the basis for the choice of informants was formed through the document analysis, the workshop and the observations.

Document analysis was conducted by looking into strategic documents as well as laws and regulations. The documents selected focused on current practice, including operational manuals like Police emergency response system, Part I: Guidelines for police emergency

(PBS I) (Politidirektoratet, 2011), Medical operational manual (MOM) (Flingtorp, Næss, & Kolberg, 2007) and The rescue service handbook (2008). These documents provided a strategic perspective of how operational emergency management is organized. The police act, the fire safety act and regulations relating to medical emergency, as well as the NOU JD 2001: 31 about the organization of rescue operations and emergency response resources. The document analysis was primarily a way to gather knowledge about the organizations, goals and tasks involved in emergency respond.

A workshop with emergency unit personnel was held by SINTEF on behalf of Bridge to gather information about the on scene work. In the workshop the participants were asked to map out among other things the important roles within the units, important elements to obtain situation awareness and communication patterns. The operational leaders within the incident command post appeared to be an important group to study when focusing on the on scene emergency response work based on the information form the workshop.

Observations of training exercises and field observations were also conducted to increase our understanding of practice that was described in formal documentation and the workshop. A two part exercise in North Trøndelag about a bus rollover was observed. A table top exercise of operational command in Steinkjer and an emergency training exercise in Levanger. Information has also been gathered through field observations by following an operational leader health at work. All observations were documented by field notes and some audio recordings. The observations gave a better understanding of the co-work between the three emergency units in the command post (CP).

Informants

The informants were all operational leaders with experience from the incident command post (ICP). The incident command post (ICP) consists of the incident leader from the police, operative leader health and operational leader of fire. All the informants are from the central eastern part of Norway. Consequently the targeted group for this study was taken from a small population. Data was gathered through 17 interviews with emergency response personnel with Operational Commander experience; six fire fighters, six police officers and five paramedics. All the informants have recently been or are currently working as Operational Commanders within Oslo or the surrounding areas (Oslo (n=7), and central eastern areas (n=10)). All informants were either permanent Operational Commander or assigned “ad hoc” leaders at certain events. They had between fifteen and thirty-five years (*M= 22.6*) of general

experience, and between two and thirty-three years (*M=11.5*) of experience as Operational Commander. Their average age was forty-eight years and all informants were male.

The interviews were conducted at the workplace of all the informants before, after or during a quiet part of the shift, except one who was interviewed in a conference room at SINTEF in one of his days off. The interviews lasted on average 30 minutes 27 seconds (R= 16 min 19 s - 46 min 38 s, SD= 7 minutes 8 seconds).

Mixed Model Design

Mixed model design is a mix of qualitative and quantitative methods. There are two major types of mixed methods research mixed-model designs and mixed-method designs (Johnson & Onwuegbuzie, 2004). According to Tashakkori and Teddlie (1998) mixed models is the most popular way of mixing methods within the behavior and social science research. One can construct mixed-model designs by mixing qualitative and quantitative methods within and across the three stages of the research process: initial clarification of the research objective, when collecting the data, or when analyzing the data (Johnson & Onwuegbuzie, 2004). It was decided to do this by constructing interview questions based on the SWOT framework (Chermack & Kasshanna, 2007) and coding the answers into categories within two frameworks; FORSTÅTT and The Interdisciplinary Collaboration Model where it was analyzed statistically in SPSS.

Qualitative data was gathered with the help of semi-structured interviews according to the SWOT framework. According to Kvale (1997), it is a strength to use interviews as data collection method because one gets variation in the data in terms of the informants' perceptions of a subject, and thus one can get a picture of a diverse and controversial human world. As the starting point for this thesis was to obtain operational managers experiences and perspectives on how interaction takes place, it was appropriate to have a conversation with them, and the interview was therefore a natural choice as the basis for data collection. SWOT seeks to find Strengths, Weaknesses, Opportunities and Threats (Helms & Nixon, 2010). This method is used to help the subject reflect about current practices and future situation (Hoff et al., 2009). SWOT does not cue the participants to any particular type of answers, but rather encourages them to reflect on the positive and negative sides of a given situation. Thereby, it encourages reflection on the strengths and weaknesses regarding their present collaboration situation and decision making, and future opportunities and threats regarding the same topics. SWOT is usually used as a strategic mapping tool, but there have been numerous claims to the

origin, the epistemological status of the tool and a lack of theoretical foundation (Helms & Nixon, 2010). The tool has been used in a multitude of fields (Rizzo & Kim, 2005). SWOT is a technique that can be applied to individuals, groups, teams, organizations, or even plans (Chermack & Kasshanna, 2007).

Quantitative analysis is done by transcribing the qualitative data and unitizing the contents into meaningful statements, each meaningful statement is then transferred into SPSS and given a value in the chosen framework. By giving the statements values in one or several frameworks one can perform statistical analysis within the material. Quantitative methods have been argued to be more appropriate for hypothesis testing than qualitative methods (Lund, 2012). By using a mixed model approach this way one can maps the participants' responses to open-ended questions into specific categories in SPSS.

Process

Preparation. Preparing and executing the interviews was based on the PEACE model consisting of five-stages. The PEACE model was produced with the aim to improve the quality of interviews of suspects, and is summarized by the mnemonic PEACE; Planning and preparation, Engage and explain, Account, Closure and Evaluate (Milne & Bull, 1999). The PEACE model was chosen to ensure the quality and consistency of the interview process for the informants and the interviewer.

The interview. Each informant was asked two sets of questions; one about collaboration and one about decisions making. The two sets of questions were asked in a randomized order, so that half of the informants were asked about collaboration first and the other half were asked about decision making first. This paper will only use the data gathered based on the questions about collaboration:

> *What strengths do you see in the way you collaborate in CP?*
> *What are the weaknesses you see the way you collaborate in CP?*
> *What can be the long term challenges in the collaboration in CP?*
> *What opportunities do you see that could help the collaboration in CP be more efficient in the future?*

The questions encouraged the informants to talk about their own experience and perspective, but since they were asked to talk about themselves in a group situation it was expected that they would talk about their colleges as well.

The method was chosen to give the informants an opportunity to talk freely with

minimal guiding from the interview guide. Additional information was acquired by asking the informants follow up questions, such as: “Are there other strengths related to…?”, “Could you illustrate this by giving an example?”, and “Could you specify what you mean by…?”. If the participants mentioned something of interest in the former interview, they were asked to repeat the information. The interview was always conducted with one interviewer and one observer. There should be more than one person present at the interview to minimize bias and provide objectivity and measurable reliability (Kvale, 1996).

Transcription. All the interviews were taped, and afterwards the recordings were transcribed according to a transcription procedure. This procedure states that the recording should be transcribed verbatim, only leaving out technical discussions and affirmative statements by the interviewer (e.g. yes, right and mhm). All the transcriptions are written in the transcribers’ sociolect. According to Flick (1998) exaggerated accuracy in transcription procedures are necessary only when relevant to the content of the interview and will in many cases be an unnecessary use of time. Examples of the things that were left out are a discussion about a coffeepot, the noise in the next door room and informants answering their cellphone or radio since they were at work.

Unitizing. A content analysis was conducted on all the transcribed interviews, resulting in quantifiable units of text. This process is called unitizing, and resulted in two types of statements; meaningful statements and example statements. A statement was defined as the smallest meaningful unit that represents a new topic of interest. A statement can contain a part of a sentence, a whole sentence or several sentences, according to this definition (Hoff et al., 2009). One statement should be small enough to contain only one topic (Weber, 1990). Example statements were statements that exemplified or elaborated a topic, without adding any new meaning. These units may also include a further explanation of a meaningful statement. Example units did not add anything unique to an already established meaningful statement. These units are connected to meaningful statements to give them more clarity, functioning as context units. Parts of sentences were also sometimes included to provide context to meaningful statements. Krippendorf (2004) points out that as long as the units are different and the same meaning is not replicated, context units can be used to describe one or several units. The unitizing was done according to beforehand agreed upon procedure developed based on literature (Krippendorff, 2004; Neuendorf, 2002; Weber, 1990). The unitizing procedures can be found in the Appendix E. Finally the statements were imported to SPSS in chronological order to preserve the context of the interview (Krippendorff, 2004).

Inter-judge reliability of unitizing. To increase the reproducibility of the unitizing process an inter-judge reliability was conducted. As Neuendorf (2002, p. 141) stated, "given that a goal of content analysis is to identify and record relatively objective (or at least intersubjective) characteristics of messages, reliability is paramount. Without the establishment of reliability, content analysis measures are useless". One interview was transcribed unitized by all three students early in the process. The three interviews were then compared using an inter-judgment agreeability measure based on the percentage of agreement on presence (P.A.P.). This test was based on Zarghooni's (2011) adaption of Boyatzis' (1998) percentage of agreement of presence (P.A.P.), to account for inter-judge reliability of unitizing between two unitizers. However, it was modified in order to account for the inter-judge reliability between three unitizers. This was done by calculating the inter-judge reliability between student A and B, student A and C and student B and C, and then adding the three results together and calculating the mean value. After three repetitions of this process, the resulting inter-judge reliability of unitizing stabilized at 68 %. For further description of inter-judge reliability for unitizing, see Zarghooni (2011).

Coding. All the unitized statements from the transcribed interviews were then transferred into SPSS statistics for coding. All the statements were coded in both the FORSTÅTT check-list and the interdisciplinary collaboration model.

The FORSTÅTT check-list were operationalized into eight categories based on Vigerust, Andersen and Vollebæk's (2009) article. Each statement was given a code in SPSS from one to eight and then the residuals were given number nine. Each statement could only be coded in one of the eight categories or as a residual. The categories were Preparation (1), Information, Deployment, Organization/leadership (2), Risk Assessment, Reconnaissance, Resources (3), Securing, Situation Report (4), Triage (prioritizing) (5), Incident Management (6), Measures on Patient (7), Transportation to Hospital (8) and residuals (9).

The interdisciplinary collaboration model was operationalized based on Laura Bronstein's article called *A Model for Interdisciplinary Collaboration* (2003). The model was split into two; one collaboration part and one influencing factors part. This was done because the influencing factors might have been lost if all elements were included in one model, as they are not mutually exclusive. The collaboration model included six categories which were all given a number from one to six; interdependence (1), new activities as a result of the collaboration (2), flexibility (3), joint ownership of goals (4) and reflection on the process (5).

The statements that did not fit into any of the categories were placed in residuals (6). Each statement could only be placed in one of the categories or in residual. The influencing factors consisted of Professional role (1), Structural characteristics (2), Personal characteristics (3) or History of collaboration (4) and if the statement did not fit in any of these categories they were coded as residuals.

Statistical analysis. The statistical analysis included descriptive analysis and differential analysis made in SPSS. The descriptive analysis was constructed through cross tables, the explore function and frequency tables. The differential analysis was conducted through paired t-tests between the various averages. The normal distribution was calculated before conducting the t-tests. A bonferroni correction was considered as a way of adjustments for multiple tests, but it is deemed unnecessary by Perneger (1998) and was therefore not used in this study. Perneger argues that by using a bonferroni correction there is, among other problems, an increased possibility of making a type II error. The effect size was calculated according to Cohen`s *d* (Cohen, 1988).

Thematic analysis. A content analysis was conducted on the residual statements that were not included in ether of the models. A content analysis is according to Krippendorff "*a research technique for making reliable and valid inferences from texts to the contexts of their use"* (2004, p. 18). Statements addressing similar topics were copied in to a separate document and given an overall category title. All the statements were then copied in to a new SPSS document in the new categories.

Ethical considerations. Each of the informants received an information-letter in advance of the interview and a consent form based on the information-letter at the time the interview was carried out. According to Flick, Kvale, Angrosino, Barbour, Banks, Gibbs and Rapley (2007), it is important to create a safe framework for the interview so that the subject can feel free to talk about topics that will later be used in a public setting. Examples of the things that were explained in the information letter and consent form were anonymity, storing of the data and further use of the information. All the informants were anonymized when the interviews were transcribed. The anonymizing included the name and workplace of the informant, as well as all people mentioned in the interview. The data will only be used by members of the Bridge project and will be deleted after the completion of the Bridge project in 2014. The interviews were conducted in Norwegian, but sections of the information were later translated into English. This was done to make the informants more comfortable and not add any stress

to the situation by asking them to answer in another language. A copy of the full sets of questions along with the information-letter and consent form can be found in Appendix A-C.

Results

Descriptive Statistics

A total of 2277 statements were identified in the 17 interviews. There was 628 statements which were identified as examples and therefor excluded from the dataset, leaving 1649 statements (M =97, SD=32.22) as the basis for further analysis.

The FORSTÅTT check-list accounted for 1072 of the 1649 statements (*M* =63.06 and *SD* =23.73). A total of 582 statements were not accounted for by the FORSTÅTT check-list (*M* =33.94, *SD* =10.50). These statements were distributed across all categories, but were somewhat unevenly distributed (Range=5-405 and SD=136.40). The distribution of the statements in FORSTÅTT can be seen in Table 1.

Table 1.

FORSTÅTT

Category	Count	Mean	SD
F preparation	405	23.82	10.50
O information, deployment and organization / management	139	8.18	5.29
R risk assessment, reconnaissance and resources	230	13.53	7.67
S securing and situation report	108	6.35	4.66
T triage (prioritizing)	19	1.12	2.23
Å the incident management	159	9.35	7.50
T measures on patient	6	0.35	0.86
T transportation to hospital	5	0.29	0.59
FORSTÅTT	1072	63.06	23.73
Residual	577	33.94	10.50
Total	1649	97.06	32.24

The interdisciplinary collaboration model accounted for a total of 1364 statements out of 1649 (M=80.24 and SD=25.72). The interdisciplinary collaboration model consists of the collaboration elements and the influencing factors. A total of 285 statements (M =16.76 and

SD=11.12) were not accounted for by the interdisciplinary collaboration model. For the distribution between the categories see table 2.

Table 2.

Interdisciplinary collaboration

	Category	Count	Mean	SD
Interdisciplinary collaboration				
	Interdependence	549	32.29	12
	Newly created professional	88	5.18	5.47
	Flexibility	61	3.59	3.18
	Collective ownership of goals	334	19.65	10.87
	Reflection on process	123	7.24	5.49
	Residual	494	28.94	13.73
	Total	1649	97.06	32.24
Influencing factors				
	Professional role	235	13.82	10.06
	Structural characteristics	374	22.00	9.97
	Personal Characteristics	214	12.59	6.43
	History of collaboration	78	4.59	3.08
	Residual	748	44.00	22.77
	Total	1649	97.06	32.24

Table 3 explains the relationship between the collaboration elements and the influencing factors when combined.

Table 3.

Cross-table between the collaboration elements and the influencing factors

		Influencing factors					
		Professional role	Structural characteristics	Personal Characteristics	History of collaboration	Residual	Total
Interdisciplinary collaboration	Interdependence	92	106	129	42	180	549
	Newly created professional	16	34	7	3	28	88
	Flexibility	17	16	4	1	23	61
	Collective ownership of goals	78	41	38	10	167	334
	Reflection on process	7	24	14	16	62	123
	Residual	25	153	22	6	288	494
Total		235	374	214	78	748	1649

By combining the results from both parts of the interdisciplinary collaboration model and the FORSTÅTT check-list, 1516 of the statements were covered. The number of shared statements and unique additions for each of the models is illustrated in Figure 1.

Figure 1.

Overlap between the two frameworks

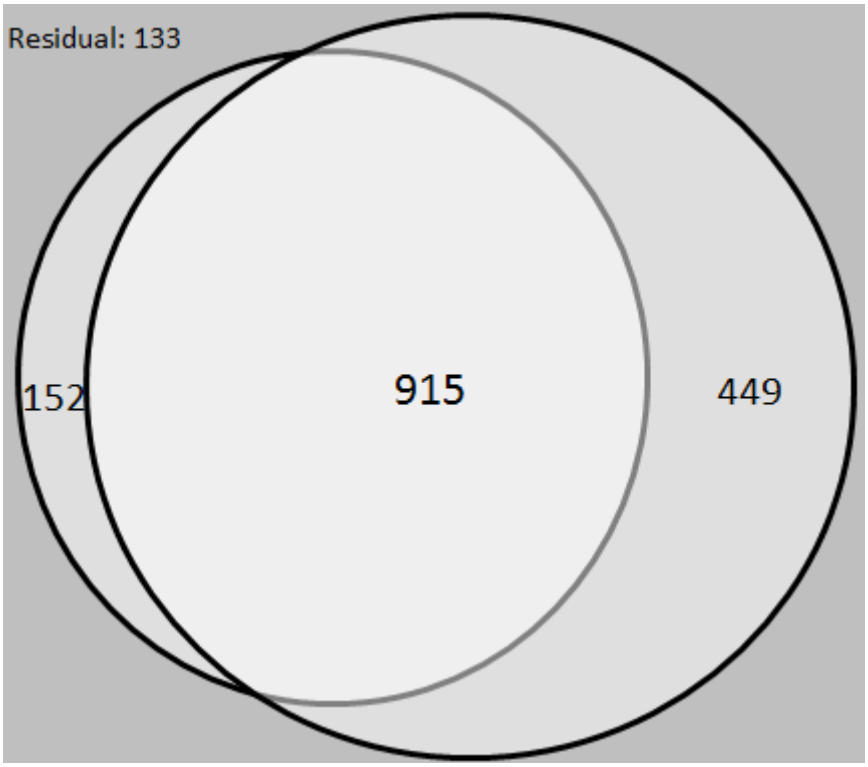


Table 4.

Cross-table between the statements captured by the FORSTÅTT check-list and the interdisciplinary collaboration model

	FORSTÅTT									
Interdisciplinary collaboration	F	O	R	S	T	Å	T	T	Residual	Total
Interdependence	136	64	67	39	1	66	0	2	174	549
New professional activity's	27	7	22	3	1	6	2	1	19	88
Flexibility	6	3	8	0	2	22	1	0	19	61
Collective ownership of goals	44	30	95	31	14	34	2	1	83	334
Reflection on process	48	3	4	4	1	5	1	0	57	123
Influencing factors	53	21	19	13	0	8	0	1	91	206
Residual	91	12	15	18	0	18	0	0	134	288
Total	405	140	230	108	19	159	6	5	577	1649

Hypothesis Testing

Hypothesis 1 predicts that the FORSTÅTT check-list explains all the statements the informants gave about collaboration between the operational commanders at the incident area. A paired sample t-test was conducted and showed a significant difference between the number of statements in FORSTÅTT given by each informant (M =63.06, SD =23.73) and the total number of statements for each person (M=97, SD=32.22), t (16) = 29.982, p<0.001. *d= 0,98*, r(15) = .97, p < .01. The first null hypothesis is therefore rejected.

Hypothesis 2 predicts that the interdisciplinary collaboration model explains all the statements the informant gave about collaboration between the operational commanders at the incident area. A paired sample t-test showed a significant difference between the number of the interdisciplinary collaboration statements each informant gave (M=80.24 and SD=25.72) and the total number of statements for each person (M =97, SD=32.22), t (16) = 18.556, p<0.001. *d= 0,96, r*(15) = .95, p < .01. The second null hypothesis is therefore rejected.

Hypothesis 3 predicts that the FORSTÅTT check-list and the interdisciplinary collaboration model together explain all the statements about collaboration that were given by the operational commanders. A paired sample t-test showed a significant difference between the number of the interdisciplinary collaboration statements each informant gave (M=80.24 and SD=25.72) and the total number of statements for each person (M=97, SD=32.22), t (16) = 12.024, p<0.0001. *d= 0,91, r*(15) = .99, p < .01. The third null hypothesis is therefore rejected.

Hypothesis 4 intended to investigate whether the residual after combining the FORSTÅTT check-list and the interdisciplinary collaboration model were relevant for collaboration. The hypothesis predicted that these statements had no relevance for the collaboration between the three emergency units. To investigate this assumption a content analysis was conducted on the statements not accounted for. A content analysis of the 136 residual statements was performed, and the content analysis revealed 7 categories that contained information relevant to collaboration between the three emergency units. The content analysis showed that only 4.4 % of the statements in the residuals from both models were irrelevant to the topic. The categories within the residuals are shown in table 4. The fourth null hypothesis is therefore rejected.

Table 4.

Categories within the residuals

	Residual categories	Frequency	
		n	%
External conditions	Change and expectations from society	46	34%
	Technological tools	52	38.5%
	National standards	7	5.2%
Group conditions	Leader exercise	2	1.5%
	Different preconditions	9	6.7%
Individual conditions	Commitment and experience	13	9.6%
	Not relevant	6	4.4%
	Total	135	100%

As shown in table 4 external conditions like society, technological tools and hindsight were among the most frequent statements within the residual categories. The group conditions were different preconditions and leader exercise. Different preconditions among the three emergency units were also a topic that was mentioned quite a few times and includes statements about different work conditions, education and organization between the three units. The leader exercise category describes the need for separate training of the incident CP situation. Within the individual conditions there were two categories; one covered the commitment to the job, the other one covering the value of experience. Not relevant were statements that were ambiguous or not related to the theme.

Post Hoc Analysis

The paired sample t-tests showed that neither of the FORSTÅTT check-list, the interdisciplinary collaboration test or the combination of the two frameworks captured the majority of the statements. Based on the fact that all four hypotheses were rejected, a post hoc analysis was performed. In the post hoc analysis the FORSTÅTT check-list and the interdisciplinary collaboration model were combined as well as adding the residual categories. Based on the descriptive analysis (table 5) of the new framework there are only 6 statements left in the residual category.

Table 5.

Comparison of the frameworks

	FORSTÅTT	Interdisciplinary collaboration	Combined	Including the residual-categories
Included	1067	1364	1516	1643
Residual	582	285	133	6
Total	1649	1649	1649	1649

Discussion

Summary of Results

The purpose of this study was to empirically test two different models about interdisciplinary collaboration, and test the ability of the frameworks to describe the reflections about the collaboration among emergency response leaders within the ICP. The models were tested against information gathered from semi-structured interviews with 17 operational leaders from all three emergency units. The interviews generated a lot of information about collaboration and a total of 1649 statements were identified and coded in the two models.

The descriptive statistics show that the FORSTÅTT check-list accounted for 1072 out of the 1649 statements, while the interdisciplinary collaboration model accounted for 1364 of the 1649 statements. When the FORSTÅTT check-list and the interdisciplinary model are merged, the two frameworks account for 1516 out of the 1649 statements. The merged framework explains more of the data together then they can individually. However, as shown in figure 1, the majority of these statements (915) were coded in both the FORSTÅTT model and the interdisciplinary collaboration model. The coverage of the data does only increase with 9% by adding the FORSTÅTT check-list to the interdisciplinary collaboration model. This suggests that the two models to some degree explain the same aspects in the data.

Hypothesis 1 was applied to test whether a domain specific model, based on Vigerust, Andersen & Vollebæks common operational procedures (2009) were able to account for the answers given by operational leaders from the three emergency units to an open ended questions about collaboration. Even though that the check-list is based on the existing operational procedures from all three emergency units, the analysis shows that only 1067 of the 1649 statements from the interviews are accounted for by FORSTÅTT. The distribution of statements as presented in Table 1 shows that there is an uneven distribution among the categories. The t-test test shows that there is a significant difference between the statements captured in FORSTÅTT and the total number of statements. The significance level indicates that it is little chance that this result is caused based on coincidence. The effect size for this test indicates according to Cohen`s *d* (1988) a high effect size, which might indicate a substantial result. This suggests that FORSTÅTT check-list alone is unable to account for all the statements from the interviews. A paired sample t-test was conducted to assess the differences between the statements covered by the FORSTÅTT check-list and the total number of statements and based on this result hypothesis 1 is rejected.

Hypothesis 2 was used to test whether a generic model, based on Bronstein´s (2003) interdisciplinary collaboration model, "A Model for Interdisciplinary Collaboration" is able to account for the answers given by operational leaders from the three emergency units to an open ended questions about collaboration. The model is based on existing interdisciplinary models and extensively cited in social worker, nurse and educational literature. The analysis shows that only 1364 of the 1649 statements from the interviews can be accounted for by the interdisciplinary collaboration model, leaving 17% of the statements unaccounted for. The t-test result shows that there are statistically significant differences between the statements covered in the interdisciplinary collaboration model and the total number of statements, this test does also have a high effect size according to Cohen`s *d*. This suggests that the interdisciplinary collaboration model alone is unable to account for all the statements from the interviews. Through a paired sample t-test the interdisciplinary collaboration model and the total number of statements was compared, based on this result hypothesis 2 was rejected as well.

Hypothesis 3. Although the FORSTÅTT check-list claims to be common operational procedures to make the collaboration easier for the three units, the models focus is in most parts on operational procedures for the emergency response process. The FORSTÅTT check-list makes no claims to be a cross-professional collaboration model, but rather a common

procedure which promotes interaction between the three units (Vigerust et al., 2009). The idea is that a combination of this model and the interdisciplinary collaboration model together can explain all the statements about the interaction between the three different emergency agencies. As mentioned earlier Paton, Johnston and Houghton (1998) argues that there is an international tendency of more multi agency and multi-jurisdictional work within emergency response. Hypothesis 3 was for that reason applied to test whether a combination of the FORSTÅTT check-list and the interdisciplinary collaboration model together could account for all statements extracted from the interviews. The results show that the combined models account for 1516 (92 %) of the total statements. This shows that a combined model can account for a larger part of the statements than the models are able to individually. However, as presented in Figure 1, a considerable part of these statements is identified in both models. The FORSTÅTT check-list only accounts for 152 statements unaccounted for by the interdisciplinary collaboration model. However, a paired sample t-test show that there was an significant difference between the statements captured by the two frameworks and the total number of statements. The significance level indicates that it is little chance that this result is caused based on coincidence. The effect size for this test is high according to Cohen`s *d* (1988), which might indicate a substantial result. Based on the high correlation there may give an artificially high result. However, based on this result hypothesis 3 is also rejected.

Hypothesis 4. The thematic analysis of the residual analyses of the 135 residual statements revealed that 4.4% of the statements were irrelevant to the topic. The statements were organized into seven categories which were classified into external, group and individual conditions (see table 5). This was done based on the different scope the categories have on the emergency units. The individual and group conditions might be dealt with on an agency level, as the external conditions are often of a political and society nature, which can be difficult to handle locally. Many of these categories are of great importance to collaboration and should have been included in frameworks claim to explain the collaboration in emergency units. Based on this analysis hypothesis 4 is rejected.

The Post Hoc Analysis

The post hoc analysis consists of combination of the two frameworks and the new categories derived from the thematic analysis of the residuals. The two frameworks explain somewhat different aspects of the collaboration process in emergency response. The FORSTÅTT check-list concentrates on the common necessary action at the incident area

which helps the three operational leaders to speak the same language and have a common progress when handling the incident. The FORSTÅTT check-list captures statements about the specific tasks that are preformed when they work together. The interdisciplinary collaboration model on the other hand captures the collaborative processes between the operational leaders while they solve the tasks. Together the two frameworks emphasize different aspects of collaboration, but they still don't capture all statements about collaboration. A thematic analysis of the residual from the two frameworks reviled six new categories that were relevant for the collaboration. The new categories were grouped in to external, group and individual conditions. By including these categories of the combined model applied the new model the perspective of society and the agency, and expand the individual perspective. By combining both frameworks and including the residual categories 1643 of 1649 statements were captured. This suggests that a new model based on all of these elements might be appropriate for explaining collaboration between emergency response leaders.

The Relevance of the Two Frameworks

In this section, the results from testing the theoretical model and practical framework will be discussed and connected to relevant theory. This will be done by discussing the largest and smallest categories according to the number of statements they capture in the two frameworks. Some implications will also be presented. Based on the hypotheses that have been presented in this study there seems to be no significant evidence that supports these frameworks for explaining collaboration between the emergency units. However, the results presented by looking at the descriptive statistics there is quite a large amount of the statements that fit into at least one category in one of the models. This may speak in favor of taking a closer look at the relevance of these frameworks.

FORSTÅTT Check-List

There are four elements in the FORSTÅTT check-list that stand out; the preparation, triage, measures on patient and transport to hospital. The preparation category contains almost twice the amount of statements of the second largest category. Why is the frequency of the preparation category so much higher? One explanation that comes to mind is that the preparation takes up so much more of the time. The preparation is described as everything that is done from the day you are born until the alarm goes off. Another reason might be the large focus that many of the departments have on preparation with the Operational Leader

Forum (OLF)(Direktoratet for samfunnssikkerhet og beredskap, 2012) in Oslo, designated fields of expertise that some of the operational leaders have been given (e.g. tunnels, trains, bombes and shooting in progress) and specific scenario building for every thinkable situation. The need for 'preparation' seems to be even stronger when we consider the rapid development of society (McConnell & Drennan, 2006). Schwartz (2004) argues that current trends in technology, population change, medicine, terrorism, ethnic conflicts and others, will produce 'unavoidable surprises' which to some extent we can predicted and therefor prepared for. Considering all the external elements in the residual categories, that were not included in the FORSTÅTT check-list, the preparation for these events might be the reason for the high frequency in this category. The three smallest categories were the triage category, the measures on patient category and the transport to hospital. But why were they so much smaller than the others? The first explanation that comes to mind is that all these three categories describe actions that are typical health department tasks. The main responsibility of all three emergency units is to save lives, but saving lives might consist of stopping the shooter for the police and saving people out of a burning building for the fire department. The transport to the hospital, treatment of patient and the triage might not be as relevant for the police and fire department, and even the health department when talking about their collaborative effort at the scene. The FORSTÅTT check-list seeks to be a set of common operational procedures, and should possibly not contain agency-specific tasks.

The FORSTÅTT check-list is sequential based on the five phases of the disaster management. The only phase that is described as continuous is the chaos phase. Sequential models work well within simple systems. However, they are limited in their capability to explain the interconnection between multiple elements in more complex systems (Qureshi, 2007). The operational procedures cannot foresee all the possibilities of the work context of every given situation. Instructions are often designed separately for a particular task in isolation whereas, in the actual situation, several tasks might occur at the same time. This poses additional constraints on the procedure (Rasmussen, 1997). The FORSTÅTT check-list is based on existing written procedures. That might be an advantage for the emergency personnel as they already know most of the routines included in the framework. However, as the original procedures from the different agencies have not been tested up against this sample, there is no way of telling if weaknesses exist and were transferred to the FORSTÅTT check-list.

The Interdisciplinary Collaboration Model

The interdisciplinary collaboration model captured statements within all categories, even though the distribution was somewhat uneven. Within the collaboration elements there was a much higher frequency within the interdependence and collective ownership of goals categories. That is, more than half the statements that were captured in the interdependence and collective ownership of goals categories. When comparing the operationalization of the interdependence categories to the other categories it includes fare more elements. Many of the elements included are very wide such as communication, understanding each other roles and respect for each other. Therefore, one can draw doubt about the wide scoop of the interdependence category. The collective ownership of goal category is also wide in scoop, and includes among other things design and execution of plans, common goals and decision making. However, the collective ownership of goals category might have a high frequency because it is an important part of the collaboration between the emergency units

The influencing factors in the collaboration model are only supportive factors that may have an impact on how collaborators interact. The model as it is presented by Laura Bronstein also separate the influencing factors from the collaboration model, which made it a natural choice to do the same. The distribution within the influencing factors were more even then the collaboration elements except for the history of collaboration category. This might suggest that the history of collaboration is less of a concern for the emergency response personnel.

The influencing factors also contribute with elements that neither of the other frameworks picks up (see table 6). According to the descriptive analysis the interdisciplinary collaboration model covers 83% of the statements about collaboration. This might suggest that this model can be suitable for explaining the collaboration between emergency response units if the model was altered a little bit to fit this specific domain. However, the differential statistics suggests that the statements covered by the total number of statements are significantly different from the statements that are covered by the interdisciplinary collaboration model. These results might be caused by the high correlation between the two measurements. But it can also mean that the model does not suffice for explaining the way emergency services personnel interact.

Combining the two frameworks. By using a mixed-model method with interviews that avoids leading the participant in any specific direction, the informants had the opportunity to reflect around the topic of collaboration without any theoretically preconceptions. By using

both practical procedures and a theoretical model of collaboration this study wanted to test whether the two frameworks could explain all the statements about collaboration. It was not an attempt to measure the collaboration between the three units. The results from the differential analysis show that the models could not account for all the statements in the interviews, but this does not mean that the models are not relevant to the topic. In fact, the descriptive statistics show that the 92 % of the statements are captured by this new framework, this might indicate that the frameworks to some extent are relevant for explaining collaboration between emergency units in Norway.

A combination of the FORSTÅTT check-list and the interdisciplinary collaboration model generates a new framework. This new "model" allow for both a common language and common understanding of how the situation should be resolved and the necessary elements that are important for interaction.

Together the two frameworks form a more completely picture of the collaboration between the emergency units. As shown in the cross-table in table 4 there are categories within the two frameworks that are more important for each other. By looking at the reflection on process in the interdisciplinary collaboration model as an example, there is an much higher frequency within the F and the residuals within FORSTÅTT. This might indicate that a lot of the reflection on process happens before the incident in the preparation phase, and possible in the evaluation phase as it is not included in the FORSTÅTT categories.

The collaboration model accounts for more statement then the FORSTÅTT check-list, but they both capture unique parts of the material. However, there are several important topics that were not picked up by any of the frameworks.

The Residual Categories

Since the 135 statements were distributed between 8 categories there are several very small categories and a few larger. By eliminating the categories with less than 10 statements we are left with only four categories, these are; society, technological tools, hindsight and commitment and experience. The first implication of this study is based on the residual categories and concentrates on external influencing factors. Manoj and Baker (2007) identified three categories of collaborative and communication challenges: technological, sociological, and organizational. These challenges are also identified by other researchers (e.g. Thévenaz & Resodihardjo, 2010; Richard, 2001; Waugh and Streib, 2006; Endsley 1995;

Bolstad & Endsley, 2003; Graves, 2004). According to Smith (2006) it is possible to minimize the extent of the damage on both human lives and economy by adoption of technologies that focus on inter-agency collaboration. Training, information management, decision making, coordination, team work and incident management processes will to a great extent be affected by being executed in a multi-disciplinary context (Paton et al., 1998). There is a strong predominance of external factors that fall outside the frameworks that was tested. This might be based on two aspects; that the models do not adequate captures the external factors and that the external factors are more important for interaction between emergency services and their work in general than expected. Both of these reasons or a combination of them can indicate that it may not have been enough focus on the external factors and their importance for the interaction.

The society category is the overriding category that includes expectations from society, the changes in society that produces new types of incidents, pressure from society and hindsight after the fact. If the incidents are influenced by changes in society which create never before encountered incidents the emergency units may be hampered in their response (Thévenaz & Resodihardjo, 2010). Hindsight bias can mislead a reviewer into simplifying the reasons of an accident without considering the real-time situation. Given that the information about an accident is spread over many participants, none of which may have complete information, hindsight bias makes it easy to arrive at a simple solution when all the facts are on the table (Richard, 2001). This makes hindsight an important element of the collaboration between the different units since the different operational leaders in ICP might have different parts of the puzzle. Another aspect is the expectations from society, is not always compatible with the economical constrains set by the government and agencies. To meet the expectations of society it is even more important for the agencies to collaborate, each agency offering their resources and expertise to the collective efforts.

The technological tools category consists of topics like wishes for new tools, reluctance to use technological tools and danger of technology when working with sensitive information. According to Waugh and Streib (2006) collaboration tools have a major impact on the operations, however collaboration tools typically require firewalls and there may be administrators reluctant to sacrifice network security for mission needs. Examples of tools that informants mentioned were maps, decisions support and resource and information overview tools. These tools would all help the collaboration if they integrated all emergency

unites in to one tool. According to Smith (2006) we may not be able to prevent these incidents, but we can lessen the effects of these incidents by adopting collaboration technology across agencies. This is backs up the argument presented by Endsley (1995), that there is a need for suitable technological tools and techniques to support communication and collaboration. A number of different tools or devices can be considered for supporting collaboration. Management portals, global positioning system (GPS) tracking devices, geographic information systems, a collaborative virtual workspace with video teleconferencing, instant messaging, shared whiteboards, and shared documents, and a virtual command center visualization tool are just a few of the suggestions in the literature (Bolstad & Endsley, 2003; Graves, 2004). Interaction that are mediated by technology may negatively impact the development and maintenance of shared situation awareness among team members if the tools are not tailored to the need of the users (Endsley, 2003).

General Discussion

The challenges for the emergency response units are getting gradually more complex. There is an increase in the natural disaster, technology is getting more dominating in society allowing for new forms of technological disasters, foreign and domestic extremist groups are posing a larger threat and our shipping and oil industry poses complicated challenges for the emergency units (Direktoratet for samfunnssikkerhet og beredskap, 2011). The complexity of today's emergency situations might consist of several incident areas, contradicting information and never before encountered situation. To be able to withstand such situations it may be imperative to collaborate across agencies and jurisdiction (Direktoratet for samfunnssikkerhet og beredskap, 2012; Lereim et al., 2012; Sønderland et al., 2012).

Although the results from the analysis show that each of the frameworks alone were unable to account for the majority of the statements in this study, the two frameworks when combined accounted for 92% of the statements about collaboration. This suggests that these frameworks are somewhat relevant for collaboration between the emergency response units. Based on the descriptive results it is possible to draw assumptions about the importance of elements like shared operational procedures and a focus on interdisciplinary collaboration.

The demand for rapid response, the time pressure, the vital decisions that needs to be made based on limited information and the large specter of agencies involved during and after incidents are all vital elements of the response (Direktoratet for samfunnssikkerhet og beredskap, 2012; Sønderland et al., 2012). Finding the best way to approach these tasks is

valuable as improved performance in emergency management might save lives and prevent unnecessary escalation of disasters. Collaboration is essential to reach their common goals. Nevertheless, disasters often create a strong desire for someone to take charge, or possibly to be held accountable. Such thoughts can be created by a tendency of hindsight and can create blindness to the advantages of collaborative action. There are pressing matters in emergency management that help drive collaboration, but the expectations from society, tendency of hindsight discussions and the great responsibility resting on emergency response workers puts pressure on the kind of security promised by a commanding leader (Waugh & Streib, 2006). By introducing shared standard operational procedures it may be easier to divide clear areas of responsibility. It can also provide a form of check-list for the person preforming the tasks, as well as give the other operational leaders a way to double check if things have been done. This might encourage collaboration at the same time as someone can be held responsible for each task.

Another aspect that might be influenced by the collaboration is the decision making process and shared operational picture. According to Kerr (2004) decision making in a group can often lessen the chance of human error. Also, the decision will be based on a complete information picture. This emphasizes the importance of the inter-agency collaboration between operational leaders allowing for information flows between the units. The collaboration and information sharing between the emergency units can increase the chance of the operational commander creating a shared understanding of the situation. Shared situation awareness is important for team members to know which information needs to be shared, to know which devices that are available for sharing the information, the ability to interpret information in the same way, and the process of sharing information (Bolstad & Endsley, 2000). It should therefore be facilitated for collaboration through shared education and clear guidelines for collaboration between the various units. It is also important to create a culture that promotes collaboration and clarifying the benefits of collaboration for all agencies. This culture must be secured at the top of each unit to give it priority in funding and in time for interaction (Bronstein, 2003). As this is political and financial topics it is natural to move on to the next part of the discussion, which concentrates on the facilitation for collaboration from the agencies, political quarters and from society in general.

In order to be able to obtain an effective collaboration across agencies and jurisdiction, it is important to prioritize this area at the agency level, political level and in society in general.

On the agency level this might be done by focusing on joint training (Streichert, 2005) and common education (Hall & Weaver, 2001). According to Waugh and Streib (2006) it is important to create bonds between the operational leaders from the different units in order to improve verbal and non-verbal communication between them. This was backed up by statements made by some of the informants in this study. It is not given that everyone knows how to collaborate. When combined with the challenge of collaborating with professionals from other disciplines it may be beneficial with training and formal as well as informal gatherings to learn about the other agencies' work methods, resources and disciplines. The agencies may also facilitate for collaboration with common evaluations after small and larger incidents and training exercises (*Håndbok for redningstjenesten*, 2008). These are all elements that are dependent upon financial support from the political and social quarters. It might therefore be important to consider how much resources society should use on emergency response in peace time. Is it realistic that Norway should have that same preparedness in the whole country? First of all there are different needs in different parts of the country. Oslo have embassies, the castle, subways and a larger amount of people than other places, areas around the oil platforms and industrial areas have explosives, the need for boats and environmental issues, in the north of Norway there are larger distances and snow and darkness at a larger part of the year. All these issues demands specific attention and might suggest that different parts of the country should have customized solutions for their particular needs. Another concern is if the large distances between many places in the country which makes it possible to defend the acquisition of resources such as helicopters, airplanes and snowmobiles. These resources can be distributed and shared across the country, but that again requires collaboration across the different jurisdictions.

Limitations

Throughout this study choices have been made that might have affected the results. Limitations in this study might be based on the theory, the sample and the choice of methods. As this study is based on the FORSTÅTT check-list and the interdisciplinary collaboration model, it is important that these frameworks have been understood and used in the right way. The FORSTÅTT check-list has never before been tested empirically or practically. It is therefore possible that the way FORSTÅTT has been operationalized in this study has placed too little emphasis on the phases or elements of the categories were over or under interpreted. That might affect the reliability. The article is not specific about how following these

procedures will improve collaboration, it is therefore possible that the framework is unsuitable for this form of study.

The interdisciplinary collaboration model is developed based on social work theory from the United States of America. The fact that the model is developed based on another field and another country might influence the suitability of the model for capturing the collaboration between the emergency services.

This study has been performed on operational leaders from the three emergency units in Oslo and the sounding areas. This sample can be a bit too limited to generalize for the whole of Norway, which may mean that the results of this study have a limited value in use.

Another limitation might be connected to the choice to use a mixed-method approach. The mixed-models method is a combination of qualitative and quantitative methods. The data gathering process consists of open ended interview questions based on the SWOT framework. SWOT interviews are sensitive of the reflection of the informant and the domain knowledge they possesses. If an informant has a high level of domain knowledge but a low level of reflection you might get fewer answers When using this method the qualitative data has to be transformed in to quantifiable units that can be analyzed statistically. The transforming of the data happens through transcriptions of the interviews, unitizing into meaningful statements and transferred in to SPSS. After the statements have been transferred into SPSS, the data is coded into the theoretical frameworks. In this process there are many opportunities for interpretation, which might weaken the reliability. To ensure the reliability there was performed an inter-reliability test from the unitizing process, but based on time constraints there were not performed an inter-reliability test for the coding. This might lead to an over or under coding into the categories or affect the reliability.

The results were mainly found through analysis of the prevalence of statements. But the frequency of statements does not always reflect how important the topic is for the participant. The lack of statements within a category does not necessarily mean that the category is not important for the interaction. A single statement may emphasize a very important point, while ten statements may describe topics that are less important. Therefore, the relative importance of the categories is not assessed with this method.

Future Studies

There is still a need for a better understanding of the multi-agency collaboration between emergency units, even though some research has been conducted in closely related fields (e.g. Bolstad & Endsley, 2003; Simo & Bies, 2007; Smith, 2006).

One of the aspects that should be looked further into is the emergency response units place in the multi-, cross- and interdisciplinary collaboration debate. As the terms are somewhat unclear, and sometimes contradicting, it is difficult to place emergency response collaboration within one of them. A greater understanding of the form of collaboration the emergency response units are engaged in might clarify the field for future researchers and clarify which part of the existing literature that can be applied to emergency response studies. Another suggestion for further studies is whether an extended collaboration model based on FORSTÅTT, the interdisciplinary collaboration model and the residual categories would account for a significantly part of the collaboration between emergency response personnel.

A third aspect that should be researched further is the advantages and disadvantages of response units' collaboration. With a further knowledge about the advantages and disadvantages of multi-agency collaboration it would be possible to make training programs based on this information.

A fourth aspect is the possibility to further development of Bronsteins (2003) model for interdisciplinary collaboration. The main aspect to be improved is the scope of the interdependence category. The category includes relic on others to accomplish goals and tasks, clear roles, respect for others opinions, informal gathering and communication. This high frequency of the interdependence category might indicate that the scope of this category is too wide. The suggestion is therefore to investigate the possibility of dividing this category in to two categories, possibly interaction and communication.

A sixed topic for further studies are whether an extended collaboration model based on FORSTÅTT, the interdisciplinary collaboration model and the residual categories would account for a significantly part of the collaboration between emergency response personnel.

The last proposal for further studies is to extend this study to a larger part of Norway or possibly Scandinavia to see if the same tendencies appear. This could be done by using the index of interdisciplinary collaboration (IIC) created by Bronstein (2002). Altercation would be needed to fit the IIC to the emergency response domain.

Conclusion

In this study, the inter-agency collaboration between emergency response leaders have been examined base on two different frameworks; one was a set of shared operational procedures based on existing operational procedures from all three emergency units, the other an interdisciplinary collaboration model created in the social worker field based on existing theories about collaboration. It would seem that both frameworks used in this study were unable to explain the whole collaboration process in ICP. The interdisciplinary collaboration model was able to account for more than the FORSTÅTT check-list, and combined they covered 1516 statements out of 1649. There were topics that were not captured by either of the frameworks that might be of great importance to the collaboration process. Examples are social expectations, the commitment and experience of individuals and technological tools. These results demonstrate the complex nature of inter-agency collaboration in the emergency response domain. There is a great need for a better understanding of this field as more effective emergency response can save lives in the future.

References

Aboelela, S. W., Larson, E., Bakken, S., Carrasquillo, O., Formicola, A., Glied, S. A., . . . Gebbie, K. M. (2007). Defining Interdisciplinary Research: Conclusions from a Critical Review of the Literature. *Health Services Research, 42*(1), 329-346. doi: 10.1111/j.1475-6773.2006.00621.x

Besselaar, P. v. d., & Heimeriks, G. (2001). *Disciplinary, Multidisciplinary, Interdisciplinary -Concepts and Indicators-*. Paper presented at the conference on Scientometrics and Informetrics, Sydney, Australia.

Bharosa, N., Lee, J., & Janssen, M. (2010). Challenges and obstacles in sharing and coordinating information during multi-agency disaster response: Propositions from field exercises. *Information Systems Frontiers, 12*(1), 49-65. doi: 10.1007/s10796-009-9174-z

Bigley, G. A., & Roberts, K. H. (2001). The Incident Command System: High-Reliability Organizing for Complex and Volatile Task Environments. *The Academy of Management Journal, 44*(6), 1281-1299.

Bolstad, C. A., & Endsley, M. R. (2000). The Effect of Task Load and Shared Displays on Team Situation Awareness. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 44*(1), 189-192. doi: 10.1177/154193120004400150

Bolstad, C. A., & Endsley, M. R. (2003). Tools for Supporting Team Collaboration. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 47*(3), 374-378. doi: 10.1177/154193120304700326

Boyatzis, R. E. (1998). *Transforming Qualitative Information: Thematic Analysis and Code Development*: Sage Publications.

Bronstein, L. R. (2002). Index of interdisciplinary collaboration. *Social Work Research, 26*(2), 113-126. doi: 10.1093/swr/26.2.113

Bronstein, L. R. (2003). A Model for Interdisciplinary Collaboration. *Social Work, 48*(3), 297-306. doi: 10.1093/sw/48.3.297

Chen, R. (2008). Coordination in emergency response management. *Communications of the ACM, 51*(5), 66. doi: 10.1145/1342327.1342340

Chen, R., Sharman, R., Chakravarti, N., Rao, H. R., & Upadhyaya, S. J. (2008). Emergency Response Information System Interoperability: Development of Chemical Incident Response Data Model. *Journal of the Association for Information Systems, 9*(3), 1-52.

Chermack, T. J., & Kasshanna, B. K. (2007). The Use and Misuse of SWOT Analysis and Implications for HRD Professionals. *Human Resource Development International, 10*(4), 383-399. doi: 10.1080/13678860701718760

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*: L. Erlbaum Associates.

Dawes, S. S., Cresswell, A. M., & Cahan, B. B. (2004). Learning From Crisis. *Social Science Computer Review, 22*(1), 52-66. doi: 10.1177/0894439303259887

Dilmaghani, R. B., Manoj, B. S., & Rao, R. R. (2007). *Emergency Communication Challenges and Privacy.* Paper presented at the International ISCRAM Conference, Delft, the Netherlands,.

Direktoratet for samfunnssikkerhet og beredskap. (2004). Erfaringer etter terrorangrepet i Madrid (pp. 7-31). Tønsberg: Direktoratet for samfunnssikkerhet og beredskap.

Direktoratet for samfunnssikkerhet og beredskap. (2011). Nasjonal sårbarhets- og beredskapsrapport: Et nasjonalt risikobilde. In DSB (Ed.), *Nasjonal sårbarhets- og beredskapsrapport* (pp. 9-84). Tønsberg: Direktoratet for samfunnssikkerhet og beredskap.

Direktoratet for samfunnssikkerhet og beredskap. (2012). Evaluering av krisehåndteringen etter hendelsene i Regjeringskvartalet og på Utøya 22. juli 2011, innenfor DSBs ansvarsområder (pp. 9-68). Tønsberg: Direktoratet for samfunnssikkerhet og beredskap.

Ekerberg, Ø., Skogstad, L., & Myhrer, S. H. (2008). Tsunamien - ettervirkninger for overlebende og pårørende. *Tidsskrift for Den norske legeforening, 128*(17), 39-43.

Endsley, M. R. (1995). Toward a theory of situation awareness in dynamic systems. *Human Factors, 37*(1), 32.

Endsley, M. R. (2003). Situation awareness oriented design: From user's cognitive requirements to creating effective supporting technologies. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 47*(3), 268.

Flick, U. (1998). *An introduction to qualitative research*: Sage.

Flick, U., Kvale, S., Angrosino, M. V., Barbour, R. S., Banks, M., Gibbs, G., & Rapley, T. (2007). *Doing Interviews*: SAGE.

Flin, R., Slaven, G., & Stewart, K. (1996). Emergency Decision Making in the Offshore Oil and Gas Industry. *Human Factors: The Journal of the Human Factors and Ergonomics Society, 38*(2), 262-277. doi: 10.1177/001872089606380207

Flin, R. H. (1996). *Sitting in the hot seat : leaders and teams for critical incident management*. Chichester [England] ; New York J. Wiley.

Flingtorp, L. D., Næss, A. C. B., & Kolberg, J. P. (2007). *Medical Operational Manual* (6 ed.). Oslo: Ullevål unviversitetssykehus.

Graves, R. J. (2004). *Key technologies for emergency response.* Paper presented at the International Workshop on Information Systems for Crisis Responds and Management, Brussel.

Hall, P., & Weaver, L. (2001). Interdisciplinary education and teamwork: a long and winding road. *Medical Education, 35*(9), 867-875. doi: 10.1046/j.1365-2923.2001.00919.x

Harrald, J., & Jefferson, T. (2007). *Shared situational awareness in emergency management mitigation and response*. Paper presented at the 2007 40th Annual Hawaii International Conference on System Sciences (HICSS'07), Hawaii. http://x-port-sfx.uio.no/sfx_ubo?sid=google&auinit=J&aulast=Harrald&atitle=Shared%20situational%20awareness%20in%20emergency%20management%20mitigation%20and%20response&id=doi%3A10.1109%2FHICSS.2007.481

Helms, M. M., & Nixon, J. (2010). Exploring SWOT analysis - where are we now?: A review of academic research from the last decade. *Journal of Strategy and Management, 3*(3), 215-251. doi: 10.1108/17554251011064837

Helsloot, I. (2005). Bordering on reality: findings on the bonfire crisis management simulation. *Journal of contingencies and crisis management, 13*(4), 159.

Hoff, T., Flakke, E., Larsen, A.-K., Lone, J. A., Bjørkli, C. A., & Bjørklund, R. A. (2009). On the Validity of M-SWOT for Innovation Climate Development. *Scandinavian Journal of Organizational Psychology, 1*(1), 3-11.

Håndbok for redningstjenesten. (2008). handbook. Oslo.

Jessup, R. L. (2007). Interdisciplinary versus multidisciplinary care teams: do we understand the difference? *Australian Health Review, 31*(3), 330-331. doi: http://dx.doi.org/10.1071/AH070330

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher, 33*(7), 14-26. doi: 10.3102/0013189x033007014

Jorkjend, L., Røkke, M., Helgeland, W. B., Suhrke, T., Orsten, L., Laugaland, K., . . . Stokstad, E. (2001). *Når ulykken er ute*. Oslo: GCSM AS.

Junglas, I., & Ives, B. (2007). Managing IT in a Disaster: Lessons from Hurricane Katrina. *MIS Quarterly Executive, 6*(1), 39-51.

Kapucu, N. (2005). Interorganizational Coordination in Dynamic Context : Networks in Emergency Response. *Connections, 26*(2), 33-48. doi: 10.1.1.126.5923

Kapucu, N. (2006). Interagency communication networks during emergencies. *American review of public administration, 36*(2), 207.

Kenny, G. (2002). The importance of nursing values in interprofessional collaboration. *British journal of nursing, 11*(1), 65.

Kerr, N. L. (2004). Group performance and decision making. *Annual Review of Psychology, 55*(1), 623.

Krippendorff, K. (2004). *Content analysis: an introduction to its methodology*: Sage.

Kvale, S. (1996). *Interviews: an introduction to qualitative research interviewing*: Sage Publications.

Kvale, S. (1997). *Det kvalitative forskningsintervju*. Oslo: Ad notam Gyldendal.

Lawrence, R. J., & Despres, C. (2004). Futures of transdiciplinarity. *Futures, 36*(4), 397-405.

Lereim, I., Prietz, R., Strand, M., Klinkenberg, E., Ellefsen, M., Misvær, G., . . . Jamtli, B. (2012). *Helseinnsatsen etter terrorhendelsene 22.juli 2011*. Oslo: Helsedirektoratet.

Little, R.,2004.Holistic strategy for urban security. *Journal of Infrastructure Systems.* 10(2),52–59. doi: 10.1061/~ASCE!1076-0342~2004!10:2~52!

Lund, T. (2012). Combining Qualitative and Quantitative Approaches: Some Arguments for Mixed Methods Research. *Scandinavian Journal of Educational Research, 56*(2), 155-165. doi: 10.1080/00313831.2011.568674

Manoj, B. S., & Baker, A. H. (2007). Communication challenges in emergency response. *Commun. ACM, 50*(3), 51-53. doi: 10.1145/1226736.1226765

McConnell, A., & Drennan, L. (2006). Mission Impossible? Planning and Preparing for Crisis1. *Journal of contingencies and crisis management, 14*(2), 59-70. doi: 10.1111/j.1468-5973.2006.00482.x

McGuire, M. (2006). Collaborative Public Management: Assessing What We Know and How We Know It. *Public Administration Review, 66*(ArticleType: research-article / Issue Title: Special Issue: Collaborative Public Management / Full publication date: Dec., 2006 / Copyright © 2006 American Society for Public Administration), 33-43.

Mendon, D., Jefferson, T., & Harrald, J. (2007). Collaborative adhocracies and mix-and-match technologies in emergency management. *Commun. ACM, 50*(3), 44-49. doi: 10.1145/1226736.1226764

Milne, R., & Bull, R. (1999). *Investigative interviewing: psychology and practice*: Wiley.

Neuendorf, K. (2002). *The content analysis guidebook*: Sage Publications.

Oomes, A. H. J. (2004). *Organization awareness in crisis management.* Paper presented at the International Workshop on Information Systems for Crisis Responds and Management, Brussel.

Pan, S. L., Pan, G., & Devadoss, P. (2005). E-Government capabilities and crisis management: lessons from combating SARS in Singapore.

Paton, D., Johnston, D., & Houghton, B. F. (1998). Organisational response to a volcanic eruption. *Disaster Prevention and Management, 7*(1), 5-13. doi: 10.1108/09653569810206226

Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. *BMJ, 316*(7139), 1236-1238. doi: 10.1136/bmj.316.7139.1236

Politidirektoratet. (2011). Politiets beredskapssystem del I: Retningslinjer for politiets beredskap (pp. 17-218). Oslo: POD-publikasjon.

Pužar, M., Andersson, J., Plagemann, T., & Roudier, Y. (2005). SKiMPy: A Simple Key Management Protocol for MANETs in Emergency and Rescue Operations Security and Privacy in Ad-hoc and Sensor Networks. In R. Molva, G. Tsudik & D. Westhoff (Eds.), (Vol. 3813, pp. 14-26): Springer Berlin / Heidelberg.

Qureshi, Z. H. (2007). *A review of accident modelling approaches for complex socio-technical systems*. Paper presented at the Proceedings of the twelfth Australian workshop on Safety critical systems and software and safety-related programmable systems - Volume 86, Adelaide, Australia.

Rasmussen, J. (1997). Risk management in a dynamic society: a modelling problem. *Safety Science, 27*(2–3), 183-213. doi: 10.1016/s0925-7535(97)00052-0

Reason, J. (2000). Human error: models and management. *BMJ, 320*(7237), 768-770. doi: 10.1136/bmj.320.7237.768

Rizzo, A. S., & Kim, G. J. (2005). A SWOT Analysis of the Field of Virtual Reality Rehabilitation and Therapy. *Presence: Teleoperators and Virtual Environments, 14*(2), 119-146. doi: 10.1162/1054746053967094

Salipante, D. M. (2002). Developing a Multidisciplinary Weaning Unit Through Collaboration. *Critical Care Nurse, 22*(4), 30-39.

Schwartz, P. (2004). *Inevitable Surprises: Thinking Ahead in a Time of Turbulence*: Gotham Books.

Simo, G., & Bies, A. L. (2007). The Role of Nonprofits in Disaster Response: An Expanded Model of Cross-Sector Collaboration. *Public Administration Review, 67*, 125-142. doi: 10.1111/j.1540-6210.2007.00821.x

Smith, S. D. (2006). Inter-agency collaboration and consequence management: an all-hazard approach to emergency incident response. *Emergency Vision* Retrieved April 11, 2012, from http://www.idsemergencymanagement.com/Common/Paper/Paper_125/Shawn%20d%20smith%20Inter-Agency%20Collaboration%20and%20Consequence%20Mgmt%20WP.pdf

Sonnenwald, D. H. (2004). Designing to support situation awareness across distances: an example from a scientific collaboratory. *Information processing & management, 40*(6), 989.

. St.meld. nr. 17 (2001-2002) Samfunnssikkerhet. (2012) Retrieved 28 th of March, 2012

Stout, R. J. (1997). Enhancing teamwork in complex environments through team training. *Group dynamics, 1*(2), 169.

Streichert, L. C. (2005). Using problem-based learning as a strategy for cross-discipline emergency preparedness training. *Journal of public health management and practice, 11*(6), S95.

Sønderland, O., Dahl, B. K., Eriksen, E., Frøyland, E., Krogstad, T., & Paulsen, Ø. S. (2012). *22. juli 2011 Evaluering av politiets innsats*. Oslo: POD-publikasjon.

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: combining qualitative and quantitative approaches*: Sage.

Thévenaz, C., & Resodihardjo, S. L. (2010). All the best laid plans…conditions impeding proper emergency response. *International Journal of Production Economics, 126*(1), 7-21. doi: 10.1016/j.ijpe.2009.09.009

Vigerust, T., Andersen, J. E., & Vollebæk, L.-E. (2009). Optimalisert Pasient Evakuering Norge. [Fagartikkel]. *Ambulanseforum, 4*, 25-29.

Waugh, W. L., & Streib, G. (2006). Collaboration and leadership for effective emergency management. *Public Administration Review, 66*(s1), 131.

Weber, R. P. (1990). *Basis Content Analysis*. Newbury Park, California: Saga Publications Inc.

Wimpfheimer, R., Bloom, M., & Kramer, M. (1991). Inter-Agency Collaboration. *Administration in Social Work, 14*(4), 89-102. doi: 10.1300/J147v14n04_07

Wood, D. J., & Gray, B. (1991). Toward a Comprehensive Theory of Collaboration. *The Journal of Applied Behavioral Science, 27*(2), 139-162. doi: 10.1177/0021886391272001

Zarghooni, S. (2011) Applying Models for Safety Climate on Rail Traffic Management (master thesis). University of Oslo, Oslo

APPENDIX A: INFORMATION LETTER

Informasjonsskriv til deltakere november 2011

Takk for at du har vist interesse for å delta i dette forskningsprosjektet.
Vi er tre masterstudenter innen Arbeids- og Organisasjonspsykologi ved Universitetet i Oslo som skriver oppgave for SINTEF, som leder BRIDGE prosjektet. I forbindelse med våre masteroppgaver ønsker vi å intervjue operative ledere fra helse, innsatsledere fra politi og fagledere fra brann, som har erfaringer fra en eller flere større krisehendelser.

BRIDGE-prosjektet
BRIDGE er et EU-finansiert prosjekt som har som mål å øke sikkerhet gjennom å utvikle tekniske og organisatoriske løsninger, for å forbedre håndtering av kriser og katastrofer. Fokuset ligger blant annet på samarbeid på tvers av etater og landegrenser ved store krisehendelser som terroranslag, naturkatastrofer og industriulykker. Prosjektet skal medføre økt sikkerhet og trygghet for befolkningen i Europa gjennom fler-faglig nødetatskoordinering og ledelse ved storskala akutthendelser. For mer informasjon om BRIDGE-prosjektet, se http://www.bridgeproject.eu/.

Mål med forskningen: Vi vil fokusere på ILKO bestående av operative ledere fra de tre blålysetatene, og se på koordinering, kommunikasjon, informasjonsbehov og beslutningsprosesser. Formålet er å teste vitenskapelige modeller, prosedyrer og «best practice» i krisesituasjoner.

Hvordan du kan forberede deg
Vi er interessert i *dine* personlige meninger og erfaringer når vi intervjuer deg, ikke andres tanker. Vi ber deg forberede deg på følgende spørsmål:

Hvilke styrker ser du ved måten du tar beslutninger i ILKO i dag?
Hvilke svakheter ser du ved måten du tar beslutninger i ILKO i dag?
Hva kan på sikt være utfordringer knyttet til beslutninger du tar i ILKO?
Hvilke muligheter ser du for at du kan ta bedre beslutninger i ILKO i fremtiden?
Hvilke styrker ser du ved måten du samhandler i ILKO?
Hvilke svakheter ser du ved måten du samhandler i ILKO?

Hva kan på sikt kan være utfordringer ved samhandlingen i ILKO?
Hvilke muligheter ser du for at samhandlingen i ILKO kan bli mer effektiv i fremtiden?

Deltakelse

Intervjuet vil foregå på norsk. Vi vil være to stykker tilstede ved intervjuet, der en intervjuer, og den andre observerer og kommer med eventuelle oppfølgingsspørsmål. Vi regner med at intervjuet vil ta ca. 1,5 til 2 timer, inkludert pause.

Håndtering av datamaterialet og konfidensialitet

I henhold til etiske retningslinjer for forskning er din deltakelse i studiet frivillig. Du kan når som helst trekke deg fra intervjuet og studiet uten å oppgi noen grunn. Intervjuet vil bli tatt opp på bånd, og deretter transkribert. Deler vil også oversettes til engelsk. Dette vil gjøre det lettere for oss å analysere data i ettertid og sikre korrekt gjengivelse av det du sier. Informasjonen du oppgir kan også være av interesse for Bridge forskere fra andre land, kun forskere i Bridge vil få tilgang til datamaterialet. Transkripsjonene vil beholdes i anonymisert form for bruk videre i BRIDGE-prosjektet. Lydfilene vil bli sletter senest ved prosjektslutt 2014.

Med mange takk,

Karen Ranestad, Ida Maria Haugstveit og Maria Borén, på vegne av Bridge forskningsteam.

APPENDIX B: CONSENT FORM

Samtykkeskjema for å delta i EU prosjektet Bridge

Ved å signere dette skjema bekrefter du at du har mottatt informasjon om prosedyrene og detaljer rundt prosjektet, at du har fått tilstrekkelig mulighet til å vurdere denne informasjonen, og at du frivillig vil delta i prosjektet. Du vil motta en kopi av dette samtykkeskjema.

Jeg bekrefter at jeg har lest og forstått "Informasjonsskriv november 2011" for Bridge prosjektet.	☐
Jeg har hatt muligheten til å vurdere denne informasjonen, og fått tilfredsstillende svar på spørsmål vedrørende forskningen.	☐
Jeg sier meg villig til å delta i intervjuet og forstår at min deltakelse er frivillig.	☐
Jeg forstår at jeg når som helst kan trekke meg som deltaker, uten å matte oppgi noen grunn.	☐
Jeg er innforstått med at informasjonen jeg gir vil bli behandlet konfidensielt av alle forskerne.	☐
Jeg tillater at mine svar blir tatt opp på lydbånd.	☐
Jeg forstår at all data som samles inn vil bli behandlet anonymt, med pseudonym.	☐
Jeg tillater at dere referer til meg som «Operativ leder»	☐
Jeg forstår at jeg kan få tilsendt kopier av resultatene av studiet.	☐

NAVN (vennligst bruk blokkbokstaver):

_____

ADDRESSE:

_____

_____

SIGNATUR til deltaker: _____

DATO OG STED: _____

APPENDIX C: INTERVIEW GUIDE

Info før intervju

- Kort intro om:
  - Masteroppgaven: tre masteroppgaver om samhandling, kommunikasjon og beslutninger. Skriver for SINTEF som leder BRIDGE-prosjektet.
  - BRIDGE: prosjekt som har som mål å utvikle metoder og teknologi for å bedre samarbeidet på tvers av etater og land under større krisesituasjoner.
- Samtykkeskjema
- SWOT
  - Nåtid/fremtid
  - Kan bli noe likt, mulig vi må be deg repetere.

SWOT - Samhandling

NÅTID

Jeg vil først høre litt som samhandlingen i ILKO slik den er pr. i dag:
Hvilke styrker ser du ved måten du samhandler i ILKO?

Jeg er fortsatt interessert i dagens samhandling, men ønsker nå å høre litt om:
Hvilke svakheter ser du ved måten du samhandler i ILKO?

FREMTID

Med tanke på dagens praksis så ønsker jeg nå å se litt fremover i tid:
Hva kan på sikt kan være utfordringer ved samhandlingen i ILKO?

Fortsatt med tanke på fremtiden:
Hvilke muligheter ser du for at samhandlingen i ILKO kan bli mer effektiv i fremtiden?

- Under svakheter nevnte du…… Hvordan kan dette løses i fremtiden?

Forsterkere:

<u>Utdype</u>
- Hva mener du?
- Hva da?
- Kan du utdype det?
- Har du et eksempel på det?
- Du nevnte….., kan du si noe mer om det?

<u>Flere S/W/O/T:</u>
- Du har allerede nevnt noen styrker/svakheter/positive/negative sider ved samhandling. Hvilke andre S/W/O/T gjelder her?

- Kan du fortelle litt mer om….?

STIKKORD:
Informasjon
Kommunikasjon
Koordinering
Samarbeid
Fleksibilitet
Situasjonsforståelse/situasjonsbilde (situation awareness)
Usikkerhet

Avslutningsvis:

Hvordan synes du det gikk?

Informere om når vi skal levere oppgavene våre, og spørre om de vil ha en kopi.

APPENDIX D: TRANSCRIBING PROCEDURES

De overordnede retningslinjer for transkribering er:

1. Tilpasse transkribering til formål med undersøkelsen
2. Konsistens (reliabilitet)
3. Åpenhet (vi beskriver hva vi har gjort)

Når det gjelder selve transkriberingen er det disse retningslinjene som gjelder:

- Vi skriver på bokmål
- Vi skriver det som blir sagt, ordrett
- Vi setter punktum ved naturlige pauser
- Vi tar med gjentakelser
- Vi skriver inn ¨Mmm¨og ¨Eh¨når dette er markert
- Dersom noe er uklart markeres dette med **uklart tidspunkt** i bold
    - Vi frastår fra å gjette/tolke hva som blir sagt
    - Ved tilfeller hvor flere snakker samtidig markeres dette med uklart dersom det ikke lar seg gjøre å forså hva som blir sagt
- Intervjuer markeres med Int.1 (eventuelt Int.2), etterfulgt av innrykk
- Respondent markeres med forkortelse av tittel (eksempel: etterforskningsleder: EFL), etterfulgt av innrykk
- Pauser, og andre verbale uttrykk som latter, hosting etc blir ikke markert fordi dette er ikke er relevant meningsinnhold og heller ikke sentralt for formålet med undersøkelsen

Tillegg:

- Noterer … når en person tenker eller ikke fullfører en setning
- Notere et tidsstempel for hvert femte, tiende, femtende, osv. minutt. Notere tidsstempel i et snakkebytte mellom intervjuer og intervjuobjekt (nærmest hvert femte minutt).

APPENDIX E: UNITIZING PROCEDURES

Mål med unitizing:
Målet med unitizing er å isolere meninger fra hverandre. Meningsfulle ytringer må forstås i seg selv. Vi må forme kortest mulige enheter med deler av eksempel/spørsmål for å klargjøre poenget.

Definisjon meningsfylt ytring: Så korte utsagn som mulig, men fortsatt meningsfulle.
The best content analyses define their context units as large as is meaningful (adding to their validity) and as small as is feasible (adding to their reliability) (Krippendorf, 2004)

Typer utsagn:

Vi har møtt på følgende type utsagn. Eksemplifisering av disse kommer lenger nede.

1. Et avgrenset og meningsfylt utsagn (statement).
2. En nyansert beskrivelse av et overordnet tema.
3. Eksemplifiseringer som bærer mening i og for seg.
4. Eksemplifiseringer som forbereder eller følger opp et statement
5. Premisser for et kommende eller allerede uttalt poeng/ytring
6. Eksempler beskriver i fortid i kontrast eller likhet til nåværende tilstand
7. Utsagn ikke knyttet til tematikk eller tema (”Northug er kongen!!!”) – irrelevante utsagn,

1. **Et avgrenset og meningsfylt utsagn (statement)**

   Hvordan vi vurderer avgrensning av meningsfylte utsagn

   - Vi ser det som et nytt utsagn ved tematisk brudd.
     - Et poeng/mening = et nytt tema, nye aktører, nye sider ved saken.
     - Eksempel: «frisk luft, frisk luft, mosjon, frisk luft» - statement «frisk luft», «mosjon», «frik luft».’
   - Vi deler i to statements der hvor det er mulig å dele uten å miste mening.
   - Vi må vurdere statements ift bottom up og top down (SWOT og andre modeller) hvis i tvil. Så lite som mulig føringer fra top-down.

2. **En nyansert beskrivelse av et overordnet tema**

   Ved store, generelle temaer lager vi også mindre statements av undertemaer.
   - En mening som gjentas og nyanseres må unitizes som en egen enhet.
     - eksempel:

- Store/generelle temaer: kommunikasjon
- Mindre statements: ikke verbal kommunikasjon, ansikt til ansikt kommunikasjon, dialog, radio etc.
- KUN når han nevner flere underkategorier, da skilles det til flere enheter. Også hvis det skilles med «og» i en setning. Hvis ikke er det del av eksempelet («i forhold til» uten «og», «fordi», «det vil si», «som gjør at».)

Bruk av klammer:

- Legge til informasjon fra spørsmål/eksempler i setninger rundt i klammer for å klargjøre meningsfulle ytringer.
- Hvis det refereres til «det/den/dette» o.l., må det eksemplifisere med klamme. For eksempel ved svar på spørsmål må det refereres til deler avl spørsmålet stilt.

3. Eksemplifiseringer som bærer mening i og for seg.

Hvordan vi vurderer eksempler som meningsfylte utsagn.

- Et eksempel som har et poeng men som ikke uttales/konkretiseres markeres i blått for å senere vurdere/konkretisere i SPSS.
- Hvis i tvil om man skal kode eksempel som en statement, ta med til hverandre og diskuter.

4. **Eksemplifiseringer som forbereder eller følger opp et statement :**
   - Alle eksemplifiseringer som understøtter/forløper en statement.
     - Følger opp/understøtter: Poeng tatt opp i neste setning, derfor kategorisert som eksempel.
     - Forbereder/forløper: Poeng tatt opp i setninger før, men konkretisert i senere statement.
     - Eventuelt legge til deler av eksempelet i klammer for å tydeliggjøre statement.
   - Disse utsagnene blir skrevet i egne setninger i SPSS, og refererer tilbake til statements.
     - De skal puttes inn i SPSS som statements, men kodes som eksempel i SPSS i stede for på modeller. De kodes i egen kolonne «eksempel» som 1, der statements blir kodet som 2.

5. Premisser for et kommende eller allerede uttalt poeng/ytring

Bakgrunnsinformasjon/kontekst, premisser som understøtter et poeng.

- Eksempel: «Vi har nødnett.»
    - Hvordan det påvirker samhandling/beslutning blir gjerne utdypet, og DET blir en statement.
- Inkludere premissen i utsagnet for å gjøre det mer forståelig. Men er premissen veldig lang blir det unitizet i grått.

6. **Eksempler beskriver i fortid i kontrast eller likhet til nåværende tilstand**

7. **Utsagn ikke knyttet til tematikk eller tema**
    - Skal ikke inn i SPSS.
    - Men de skal telles slik at vi vet hvor mye irrelevant som er tatt ut.
    - Fjerne fyllord og lydord
        - «dette er en svakhet»/»Det er en liten utfordring da»?
        - «Eeeh»
    - Fjerne ufullstendige setninger som ikke gir mening i seg selv.
8. **Utsagn som ikke blir fullført**
    - Setninger som ikke blir fullført eller fulgt opp, og ikke gir mening i seg selv.

Når det er lange eksempler kan det være lurt å se om det har blitt tatt opp før i samme eksempel og om det tilfører nye elementer eller bare gjentar de.

Fargekoding i transkripsjonene:

Hele teksten skal fargekodes i enheter, men unntak av det intervjuer sier.

Meningsfulle ytringer: gul/grønn/turkis
Eksempler og utbroderinger: grå (to nyanser hvis ulike eksempler rett etter hverandre)
Eksempel-units: mørkeblå

Statements vi er usikre på: rød skrift, legges inn i SPSS , med ref. til plassering i teksten og begrunnelse. Begrunnelse og videre kommentarer legges inn i kommentarfeltet i SPSS bak hver statement.

Ytringer som ikke er relevante for tematikken: i rosa. Skal ikke inn i SPSS.

Gjennomføring av unitizing

- Lese gjennom en gang og skille enheter fra hverandre, deretter lese gjennom en gang til for å få helheten og sile ut eventuelle «ekstra-statements»
    - f.eks: «statement» eksempel «statement», der begge statements er like og dermed den ene blir støttende setning.
- Der det er skrivefeil eller ord ikke hører hjemme (ulogisk setning), hør gjennom lydfilen. Gjør deretter endringer i den unitizede filen, og marker denne endringen i

bold. Etter at vi er ferdig med å unitize alle intervju, gå tilbake til den originale transkripsjonen og gjør nødvendige endringer.

- Når ytringer kuttes ut av teksten (7 og 8), kun kutte på begynnelsen og slutten av en statement.

SPSS:

- To SPSS filer – en for beslutninger og en for samhandling
- En deltaker har samme tall i begge SPSS filene
- Vi har to SPSS filer hver som vi slår sammen til slutt til to (beslutninger og samhandling)
- Der eksempler som hører til statements, skriver man nummeret på statement foran eksempelteksten i parantes
    - «(3) For eksempel, nå…»
- Stjerne (*) før statement hvis man har skrevet en kommentar.
- Deler av statement som er i fokus (hvis setningen gjentas) i CAPS LOCK.
- Legge til informasjon (eks. for «det») i klammer for å klargjøre meningsfulle ytringer.

Tips til andre som unitizer: marker i kommentarfeltet når det begynnes å snakkes om styrker/svakheter/muligheter/trusler

APPENDIX F: CODING PROCEDURES

- Alle statements I SPSS skal kodes på de ulike modellene.
    - Eksempler skal ikke kodes. Eksemplene blir fjernet fra analysen ved å bruke «Exclude» funksjon i SPSS.
- En statement kan kun kodes i én sub-kategori (eks. F) i hver modell (eks. FORSTÅTT)
- Passer ikke statement inn i en kategori i en modell skal den kodes som «Residual»

Ved koding av enheter som bør deles/slås sammen:

- Dele opp statement i to?
    - legge nederst i SPSS filen til informanten.
    - Skriv i kommentarfeltet til den delen som blir igjen «statement følger i …»
        - Eksempel: «statement følger 123»
    - Skriv i kommentarfeltet til den som legges nederst «følger under statement …»
        - Eksempel: «følger under statement 25»
- To statements blir ett? – lage den ene som eksempel
- Gjentakelse – kode som eksempel, skrive begrunnelse i kommentarfeltet.

FORSTÅTT operasjonalisering

- Ta utgangspunkt i FORSTÅTT – tittel og forklaring.
- Hvis i tvil på hvor statement hører hjemme, se på fasene.
- Plasseres i forhold til tema, uavhengig av «ladning» eller om det «mangler» eller «burde være».

1.

F = Forberedelse:

- Eksisterende kunnskap og erfaring
- Tenke over nødvendig utstyr og ressurser.
- Tenke over vær og omgivelser.
- Tenke gjennom sikkerhetsspørsmål (planlegging) – hvilke farer eksisterer.
- Planlegge og lage strategi for videre gjennomføring. Gjennom etablerte tiltakskort og planlegging på vei til åstedet.
- Etablere kontakt med andre operative ledere i ILKO.
- Eksempler:
    - Forberedelse innbefatter alt som skjer fra personen er født som kan ha faglig relevans.
    - OLF

2.

O = Opplysninger, oppmarsj og organisering/ledelse

- Skaffe opplysninger og informasjon på vei til skadestedet
- Tenke stort og skaffe nok ressurser
- Kommunikasjon med alarmsentralene
- Ha en plan for oppmarsj klart (f.eks. plassering av biler og andre ressurser)
- Danne ILKO og andre lederfunksjoner
- Kommunisere klart og tydelig i begynnelsen av innsatsen.
- Eksempler:
    - «Men når ting hast og du må ta avgjørelser fort, så så så den st…. det er en styrke å ha de de to i andre i ILKO.»
    - Støtte seg på andre i ILKO
    - nei det må jo være egentlig på vei til skadestedet, at man kan få en oppdatering

3.

R = risikovurdering, rekognosering og ressurser

- Risiko-/ sikkerhets**vurdering** for seg selv og andre (mannskap, pasienter, og ev. miljø og verdier)
    - Eksempel: «eeeh kan utgjøre fare for personellet og selvfølgelig s.. s.. sivile.»
- Skaffe riktig situasjonsforståelse
- Rekognosering sammen med de andre lederne i ILKO for å forstå hverandres behov og for å ikke mist hverandre.
- Skaffe nødvendige ressurser
- Proaktiv ressursvurdering (skaffe nødvendige ressurser for nå og fremover)
- Varsle andre nødetater og interessenter (Røde Kors, eksperter, NSB, grunneiere osv.
- Skaffe/knytte til seg ressurser/interessenter
- Ta med responstid i betraktning (til andre interessenter)
- Eksempler:
    - «Fordi at det tar tid. Det tar tid å få en person fram når hele byen står på hodet så så skal også denne personen da som ikke kjører utrykning, ikke har tilgang på blålys, eeeh komme til vår posisjon eeeh og tilby sin tjeneste og det er ikke lett, det tar fryktelig lang tid.»
    - Alene i ILKO
    - Tar høyde for risiko-situasjoner i fremtiden

4.

S = sikring og situasjonsrapport.

- Sikre mot nåværende og fremtidige trusler.
    - Eksempel: Når man utfører ift risiko-situasjoner, faktiske tiltak.
- Være forutseende og ikke reaktiv og hendelsesstyrt.
- Gi situasjonsrapport til egen operasjonssentral
- Gi og innhente god, riktig og tidskritisk informasjon til/fra sentralen og personer på ulykkesstedet.
- Eksempel:
    - Handler om informasjonstilgang ved drift

    - «ja asså hver etat sitter jo på sin spisskompetanse. Vi har helse og tilbyr alt det helse innebærer inn i ILKO. Eeeh politi og brann selvfølgelig sine, eeeh, i et branntilfelle så vil de kunne fortelle oss hva er det som brenner, hvor farlig er det som brenner, hva slags miljø eeeh, kan det skape for oss der vi er, eeeh og samme med politiet som da tilbyr sine kunnskaper om om fare og om eeeh sikring og sånne ting.»
- Justering av ressurser etter behov (egne ressurser)

5.

T = triage (prioritering)
- Prioritering av pasienter så alle får riktig behandling til riktig tid
- Prioritering av liv, deretter verdier og miljø
- Riktige tiltak i rett rekkefølge til rett tid
- Eksempel:
    - «For da er det å samhandle i forhold til hva skal prioriteres først, hva er mest kritisk?»

6.

Å = åstedshåndtering
- Videreføring og drift av det operative arbeidet med ulykken.
- God oversikt over situasjonen
- Klare roller og ansvar (alle vet hva de skal gjøre)
- Kommunikasjon, Koordinering og Kontroll.
- Eksempler:
    - «styrkene er det at du har to andre etater som dekker det du ikke håndterer selv»
    - Drift på den hendelsen– «Vanskeligere arbeidsforhold»
    - Ikke kjent med rollen som operativ leder i ILKO

7.

T = tiltak på pasient (Behandling)
- Etter triage, gi fysisk og psykisk førstehjelp til alle involverte

8.

T = transport til sykehus
- Starte transporten av kritiske pasienter til sykehus så tidlig som mulig.
- Kontakt med AMK (som melder til sykehus) angående transport med pasienter
- Etablere samarbeid mellom samleplass og evakueringskontrollpunkt

9.

Residual (fylt inn etterhvert som de dukket opp)
- Mellommenneskelige relasjoner.
    - Kjennskap til andre
    - Handlingsmønstre
    - «verdien og styrken, asså styrken er tillit»
    - «Du er blant folk du føler du kan stole på og og snakke fritt.»
- Eksterne elementer
    - Økonomi
    - Teknologi som en ikke har

    - Samfunnsendringer utenfor deres kontroll
    - Organisering
        - «Men generelt sett der de prioriterer den type funksjon da, sånn som her i Oslo for eksempel så er det en veldig stabil eeeh gjeng.»
- Etterarbeidsfasen
    - Evaluering
    - Erfaringsoverføring
- Bruke hverandres ressurser
- Ulike etater som premissgivere
    - Dette kan også gå under Å hvis det står i sammenheng med klare roller og ansvar. Men burde diskuteres i diskusjonsdelen.
- Media
- Justere beslutninger underveis / viktigheten av å ta en beslutning

«du har en, og du har også en en beslutningsstøtte som er veldig viktig»

Samhandlings modell operasjonalisering

1. Gjensidig avhengighet

- Gjensidige avhengigheten oppstår når ulike yrker er avhengige av samhandling mellom fagmiljøer
- Hyppig kommunikasjon mellom partene
- Avhengige av andre for å oppnå sine mål og oppgaver.
- Må fagfolk ha en klar forståelse av hverandres roller og bruke dem riktig.
- Gjensidige avhengigheten består vanligvis av formell og uformell samvær, muntlig og skriftlig kommunikasjon mellom hverandre
- Respekt for alle medarbeidere profesjonelle meninger og innspill.
    - Eksempler er når de tre etatene Tilrettelegger for hverandre eller hvem som er Premissleverandører

2. Nye aktiviteter som et resultat av samarbeidet

- Nyopprettede faglige aktiviteter er når samarbeidende handlinger, programmer og strukturer kan oppnå mer enn om de profesjonelle handlet uavhengig.
- Disse aktivitetene maksimere kompetanse av hver samarbeidspartner. Med andre ord samarbeid er når summen er større enn komponentene.
    - Bevegelig KO
    - Skyting pågår i Oslo/Akershus

3. Fleksibilitet

- Fleksibilitet er bevisst blanding av roller.
- Typiske kjennetegn ved fleksibel atferd er å nå produktive kompromisser når de møter uenigheter og
- Kreative løsninger på situasjoner.
    - Brann er innsatsleder til politiet kommer

4. Feller eierskap av mål

- Felles ansvar i hele prosessen med å nå målene,
- blant annet design, definisjon, utvikling og måloppnåelse.
- Hver fagretning og person må ta ansvar for sin egen del i suksess og fiasko
- Støtte konstruktiv uenigheter og diskusjoner innad i teamet.
- Klare definerte realistiske mål, felles forståelse, felles strategi og inkludering av andre i beslutningstakingen. Villige til å inngå kompromisser.
    - Klart definerte/ realistiske mål
    - Felles forståelse
    - Felles strategi
    - Beslutningstaking i fellesskap
    - Premissleverandør

5. Refleksjon rundt prosessen

- Samarbeidspartnernes oppmerksomhet på deres prosess med å jobbe sammen.
- Dette inkluderer at samarbeidspartnerne tenker og snakker med hverandre om deres samarbeid og prosess,
- Tilbakemeldinger til hverandre i sin evaluering prosess for å styrke samarbeidsrelasjoner og effektivitet.

6. Profesjonell rolle

- En sterk følelse av faglig rolle inkluderer å ha verdier og etikk av yrket som inkluderer en forpliktelse til Byrået innstillinger, respekt for faglige kolleger og et perspektiv som er like eller komplementære til kollegaens perspektiver.
- Ting som påvirker den profesjonelle rollen er status, hierarki, roller, verdier og praksis, og forskjellene mellom de forskjellige etatene blir forsterket av verdien hver person legger på autonomi og muligheten til å være selvstyrt.
    - Snakke samme språk
    - Få andres innspill selv om de vet svaret selv (kunnskap om hverandres felt vs inkludering)

7. Strukturelle kjennetegn

- Dette inkluderer en overkommelig arbeidsmengde, et byrå kultur som støtter tverrfaglig samarbeid, administrativ støtte, faglig autonomi, og tid og rom til å gjøre samarbeidet til å skje.
- Økonomi
    - Andre steder i landet

8. Personlige egenskaper

- Hvordan samarbeidspartnere ser på hverandre utenfor den profesjonelle rollen kollegaene holder.
- Noen av elementene i personlige egenskaper som kan påvirke samarbeidet er tillit, respekt, forståelse eller lignende perspektiver og uformell kommunikasjon mellom kollegaer.
- Følelser rundt det å samarbeide

9. Samarbeids historie

- Dette er basert på tidligere erfaring fra tverrfaglige team.
- Dersom fagfolk har en historie med å jobbe i tverrfaglige team, kan deres erfaring med denne type arbeid farge fremtidig samarbeid.

10. Residual

- Den tar ikke høyde for forberedelser/opplæring
- Inkludering av de andre etater
- Like forutsetninger (teknologi, mannskap, utdanning, tilgang til informasjon++)
- Nye samarbeidspartnere (eksterne eksperter)